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ABSTRACT

Practical assistance for adult educators is offered in this four-part document, which outlines the present status of adult education, particularly with regard to courses about computers, and discusses an approach for improving the situation. Important considerations in the improvement of adult education are discussed, including the conditions of learning, characteristics of adult learners and adult education, the effects of anxiety and attitude on learning, and the structure of change. A summary of reactions and recommendations gathered through personal interviews includes suggestions from adult students, instructors, and theoreticians. The remainder of the document is a handbook for instructors and contains a collection of ideas on the preparation, delivery, and post-delivery phases of instruction. Suggestions are included for the following times: one or two months, a week, and an hour before the course begins; as students arrive for the first meeting; the first 15 minutes, first hour or so, and the first and last few minutes of the first meeting; the first few class meetings; the final class meeting; and after the course concludes. Appendices contain lists of individuals interviewed, instructors and courses observed, and a 32-item bibliography. (LMM)

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COMPUTER COURSES FOR ADULTS

(Anxious Human Meets Computer)

A RESOURCE BOOK FOR INSTRUCTORS

prepared by

ANTHONY JAMES ALLEN

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as part of the requirements for the degree of
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Anthony J. Allen
June 1984

TO THE READER

While writing this paper, I kept before me a particular image of you, the reader. I imagine you, first of all, to be a teacher with several years of experience. I imagine that you have an interest in computers and their capabilities. You are considered *by others* to be knowledgeable about computers, their applications, and how to teach others about them. You are planning to teach, or have already taught courses about computers to adults. Finally, I "see" you as a person who is interested in *getting better* at what you do.

This resource book is divided into four parts. Parts I, II, and III describe some of the theory and practice relating to adult education and to adult computer classes. Part IV is a Handbook which contains, in condensed form, suggestions for action by instructors who wish to improve their performance. Part IV can be used independently, but prior reading of the previous sections is advised.

PREFACE

The insights, information, and suggestions contained in this paper come from:

: my personal experience;

: interviews with practitioners and theoreticians;

: my observations of courses taught by others;

: appropriate literature.

My *personal experience* with adult education includes over 30 computer courses for adults, ranging in length from 3 hours to 36 hours. *All* of these sessions were "extras," added on to my regular job of classroom teacher in elementary school.

Interview sessions and *observations* took place during February to May 1984. I tried to include conversations with theoreticians, full-time adult education instructors, part-time adult education instructors, and adult students. In all, 27 people were interviewed; some more than once. Appendix 1 provides details. *Observations* focused on the *first & last* meetings of a particular course, for reasons that will become clear soon. The 15 separate courses I observed catered to people from many walks of life and social station. Turn to Appendix 2 for details.

As indicated by Appendix 3, I drew upon a fairly broad range of *reading* material.

Throughout the information-gathering phase of my work for this paper, I noticed that many practitioners (people like you and me) feel a strong need for self-improvement and for the tools with which to accomplish it. I received more requests for copies of this paper than mere politeness can explain.

My goal is to provide practical assistance for the practicing (and often part-time) adult educator, especially those involved in computer courses. My approach to the subject is guided by these convictions:

: Instruction can be improved.

: Many improvements can be achieved by applying common sense.

: Common sense is not so "common." The obvious is easily missed.

: There is a significant research base about adult education and learning.

: There is an even larger base of knowledge about how tension and anxiety affect learning and attitude.

: Heightened sensitivity to the adults who are our students is relatively easy to attain, and it greatly enhances both the cognitive and affective aspects of learning.

PART 1: INTRODUCTION

The Growing Presence of Adult Education

The industrial model of education, though showing signs of weakening, still holds sway in much of the developed world. Children attend school during their peak learning years so they may be most useful to an industrial society during their peak producing years. Education consists of acquisition of certain knowledge and skills at particular times.

All of us would readily admit that *learning* occurs regardless of age or location. Yet *education* occurs primarily in schools and is aimed almost exclusively at children and adolescents. While this may be the prevailing situation presently, several societal forces are combining to bring a change in the way people view ordinary *education*.

Basic industries are adopting automated processes and robots. Fewer workers are employed, and those that remain require higher-level skills and greater versatility for monitoring, troubleshooting and repairing equipment. The products of medium and light industry are increasingly complex, requiring perhaps less skill to use, but more skill to design, build and repair.

Meanwhile *knowledge* is becoming a major commodity and source of power. As more raw information is made available through advances in communications and computers, people with the ability to *use* the information will enjoy substantial advantages.

Increasingly, young women are combining marriage and career. Older women are re-entering the work force after "time out" for raising a family. In both situations, training in new skills reflecting changing employment situations is needed.

The population of the United States is "greying," as mature adults represent an increasing proportion of the total population. Combine this trend with flexible working hours, longer vacations, and earlier retirement, and we find growing numbers of mature, self-motivated learners with the desire and opportunity to continue their education. "Adulthood is no longer thought of as merely a plateau between adolescence and (the grave). There is increasing evidence that adulthood is a changing, fluctuating, developmental phenomenon." (Darkenwald, et.al., 1982, pg.87)

All of this is occurring at a time when the regular schooling of children and adolescents is under fire for losing focus, for lack of discipline and for gravely-eroded standards. Many educators admit having difficulty keeping their focus when careers their students aspire to now will likely be hard to recognize in a few years. Meanwhile, remedial education is a growing business in the private and public sector.

Clearly, *Lifelong Learning* is increasing in importance. "The idea of acquiring, at an early age, a set of intellectual ... equipment valid for a lifetime is out of date. This fundamental axiom of traditional education is crumbling." (UNESCO, cited in Darkenwald, et.al., 1982, pg.2)

Also crumbling is the view that adult education refers almost exclusively to remedial and second-chance programs. "Far more important than adult education simply calculated to bring adults up to some chosen mark of formal schooling is the kind of adult education addressed to adults *as adults* and designed to assist them to live more successfully." (C. Harley Gratten, *Quest for Knowledge*, cited in Darkenwald, et.al., 1982, pg.10-11)

It is not so much a failure of regular education to do its job, as a failure to recognize the job. "...the school can give us only the instrumentation of mental growth; the rest depends upon an absorption and interpretation of experience. Real education comes after we leave school and there is no reason why it should stop before death." (John Dewey, *Democracy and Education*, cited in Darkenwald, et.al., 1982, pg.55)

The Growing Presence of Computers

The changes in our personal and economic lives, and the new skills needed to cope with these changes, are manifest in a bewildering array of artifacts from communications satellites to spliced genes. One artifact however, deserves special attention because of its pervasive influence and because it forms the basis for the rest of this paper. That artifact is the computer. It is at once part of the problem *and* part of the solution. Computerized address lists encourage masses of junk mail, while computer data banks offer unprecedented power and flexibility for information retrieval. Computers are swiftly becoming indispensible to medical diagnosticians, while the flood of research data they help produce reduces the "half-life" of a newly-certified doctor's knowledge to five years.

Big business has recognized the importance of computers for nearly 30 years, with big government following closely behind. These groups have usually handled training themselves. However, the growing vitality of small business and small government is swelling the ranks of adults who are going "back to school" to learn about the small business computer and the small computer business. Across the public and private sectors of the nation we see a growing notion that "effective employees (and public servants) result in more effective organizations." (Darkenwald, et.al., 1982, pg.68)

Adults who aren't yet encountering computers at work are quite possibly the parents of children who are exposed to them in school. Coupled with the relentless media hype, this is prompting many parents into buying personal computers. Educators themselves are near the top of the list of professionals who recognize the importance of computer literacy to working adults.

Meeting the Need

In brief, the need is for *information about and training on computers, at various levels of sophistication, for adults of various ages, job histories, educational backgrounds, and motivations.* If this shopping list seems somewhat diverse to you, don't be dismayed. The challenge is manageable and progress can be made.

As mentioned earlier, limiting the clientele to *adults* brings some economies. Considerations of psychological development and cognitive maturity are less critical. With less concern about properly educating the next generation comes a reduction in rigidity of curriculum and evaluation, and gains in flexibility. None of these benefits however, slow the rising demand for computer-related skills and knowledge. They merely make a growing problem more tractable.

How is the need being met? There are many answers to this question, some of them quite creative. School districts, universities, community colleges, neighbourhood self-help groups, libraries, museums. vendors, and individual entrepreneurs are offering more computer courses for lay people, seven days a week, morning to late at night. Still, demand outstrips supply.

How *well* is the job being done? Here we are less likely to find as clear a response. Quality of instruction, of planning, of instructional materials, and of facilities is variable in the extreme. It is this problem that the Handbook portion of this paper (Part IV) addresses.

Putting aside other issues until Part II, let me expand a little more on the instructor's situation. Though generalizations are always dangerous, I believe some broad statements can be made about the growing ranks of adult computer class instuctors. First of all, there aren't enough of them, despite a recent estimate of two million in the United States. (Darkenwald, et.al., 1982, pg.18)

This raises the issue of quality and adequacy of instruction.

In the rush to staff their growing Continuing Education Computer Classes, institutions are recruiting people who have the reputation of knowing the content but who don't necessarily have training nor skill for teaching. Meanwhile, community groups and libraries search for instructors and find the pickings very slim.

Those instructors who can boast of experience with teaching children *and* experience with using computers are actively recruited, despite the fact that experience teaching children is no guarantee of success when the venue changes to an adult computer class. There is a convincing argument made by Malcom Knowles for separating *pedagogy*, which relates to pre-adults, and *andragogy*, the "art and science of helping adults learn." (Malcom Knowles, *The Modern Practice of Adult Education*, cited in Darkenwald, et.al., 1982, pg.47)

Second, instructors are inadequately supported. They are usually hired on a part-time, ad hoc basis. They often have little energy for planning and for improving their technique, after working a full day or week at their regular job. Equipment is inadequate, especially for courses sponsored by neighbourhood groups and libraries. Classes are conducted in areas "borrowed" from some other purpose. A retailer's sales area, high school computer room, company cafeteria, or elementary school science lab might be transformed into an adult computer training centre for a few hours. We stuff adult learners into many different learning environments without much consideration of the affects. More will be said on this topic in Part II.

Research in adult education is scant and adult educators "rely extensively on the general body of theory and research findings in education and the social sciences... This general store of tested knowledge has not been sufficient." (Darkenwald, et.al., 1982, pg.25)

Third, course content is highly variable. This arises partly because of inadequate effort by instructors (who often determine the curriculum as well) and partly because a clear idea of just what *should* be in a computer course is rather elusive. This indecision should not be surprising, considering the speed at which hardware and software becomes "dated," and considering the bewildering array of personal agendas and misconceptions brought to the computer courses by adult students. Knowles cautions us that *content* is unimportant. What is crucial is the *effect upon the learner*." (Malcom Knowles, cited in Darkenwald, et.al., 1982, pg.48)

Now, some general descriptive comments about the instructor him/her self. (S)he is teaching the course for various reasons: financial renumeration, to gain experience for a possible career-change, out of a sense of community service, as a favour to a business acquaintance, or in response to a request from professional colleagues. Whatever the reasons, there are some identifiable personal impacts. It is flattering to be "in demand." It is exhilarating to be the undisputed expert in a group of one's social peers. When time and energy for course preparation is limited, it is easy for the instructor to fall back on his/her strengths - computer jargon, hardware descriptions and teaching methods successful with children. Often ignored are the adult students' strengths: motivation, experience & maturity. Indeed, many instructors identify first with their full-time occupation, which blocks acknowledgement and commitment that they are in fact adult educators. With reduced emphasis on continuity of curricula and on long-term planning, "hitting the high spots" can easily take precedence over building skills and attitudes essential for later self-directed independent learning.

Why Should We Work For Improvement?

The fact that this paper is being written indicates my conviction that the situation will not improve and will likely deteriorate without some action. In *Major Learning Efforts: Recent Research*, Allan Tough estimates that 90% of the adult population (of the U.S.) undertakes at least one major learning effort per year. (cited in Darkenwald, et.al., 1982, pg.84) It is not surprising then, that the call is heard for "major ... educational reform (which) should consist of redistributing educational programs throughout the life-span." (Bates & Labouvie, *Adult Development if Intellectual Performance*, cited in Darkenwald, et.al., 1982, pg.109)

I am not however, advocating wholesale takeover of adult education by traditional authorities. The present kaleidoscope of sponsors, offerings, and students forms a system which is highly responsive to public need. The likelihood of competition in the education marketplace may augur well for the future quality and variety of services.

It is worth noting here that in many third world nations adult education is a national priority. "Countries simply cannot wait for their youth to acquire the (intellectual) skill and knowledge necessary to address the urgent task of national development." (Darkenwald, et.al., 1982, pg.203)

Some efforts will be more productive than others. (I focus on those below.) What will be the effects?

For instructors, better adult-education skills will bring heightened satisfaction, an increased sense of efficacy, and substantial improvement in job prospects in the exciting and rapidly growing field of technology training. Any improvement in teaching technique will likely involve better interpersonal skills, an extremely valuable commodity in our society.

For the adult student, better treatment in the computer course brings a feeling of empowerment to cope with the technological age. Proper instruction frees adult students for further independent learning. Of course, the economic benefits to adults learners could be considerable as well.

For society, the transformation of adult continuing education from an "add-on" to an integral part of the social fabric is of great value. Considering that much of the current impetus for social change is rooted in the growing influence of computers, society will surely benefit from a computer-literate (rather than computer-phobic) population. Such a population will be capable of controlling and directing the growth of technology while providing an enlightened commercial market and work force.

And What of the Costs?

To say that the changes in adult continuing education described above can be achieved at little cost would be foolish. However, I will leave consideration of salaries, equipment, materials, time off, etc. for those better-equipped to compute them. Instead, I'll mention here (and expand in Part II) some less-tangible costs which are likely closer to the reader's heart than wallet. I am referring to the emotional costs of Change.

The adults who sign up for computer courses are demonstrating a willingness to take the risks associated with changing their skill levels; the risks associated with new learning. They risk encountering confusion, discouragement, and failure. For the course meetings and assignments they use time taken from leisure hours with their families, or from a work station which will be stacked high with backlog when they return to it.

The instructor who agrees to teach an adult computer course is required to take fewer risks, but still uses time "stolen" from other pursuits for course preparation, site preparation, and for the class meetings. "If teachers make a botch of it, and an uncomfortably large number do, it is because it never ... occurs to more than a handful to ask why they are doing what they are doing, to think seriously or deeply about the purposes or consequences of (adult) education." (Charles Silberman, *Crisis in the Classroom*, cited in Darkenwald, et.al., 1982, pg.38)

Make a note. A moment ago, I said the instructor is *required* to take fewer of the risks associated with new skills and learning situations. After all, there isn't much quality control involved, and the usually tepid course-evaluation forms filled out by students are more likely to reflect their relief that the instructor put up with their fumbling.

This issue of instructor risk is at the crux of my goals for this paper. The instructor is usually not *required* to take the risks associated with change and improvement, but *must* do so in order to achieve better technique. The issue of Change and how it is achieved is discussed in Part II.

Focusing Improvement Efforts

I have hinted at several areas for further study, which are more likely to produce real change for the better. Generally, these areas are:

1. The Conditions of Learning.
2. Some Characteristics of Adult Learners and Adult Education.
3. Anxiety and Attitude: Effects on Learning and Attitude.
4. The Structure of Change.

Why have these ideas been selected for special mention? Collectively they exhibit some important properties:

1. They all have application to the issue of adult computer courses.
2. They all have good potential for raising an instructor's effectiveness regarding student learning and attitudes.
3. They include many components which can be directly influenced by the instructor, acting alone if necessary.
4. They include many components which utilize existing instructor-skills and student-experience.
5. All are relatively well-researched.

The remainder of this paper focuses of these "most productive areas" for further study. Part II will outline some ideas about each area, gleaned from the literature. Part III will summarize the opinions of practicing instructors and students. Finally, Part IV will present the findings in practical form, as a Handbook for Instructors.

PART II: FOCUSING ON SOME PRODUCTIVE AREAS.

When we consider the totality of educational tradition and practice, any effort to change it seems futile. Any plan to remake education in its entirety is doomed from the start.

By limiting our consideration to improvement of Adult Continuing Education in general, and to learning to use computers in particular, we find that some issues of student maturity and psychological development, curricular standards, and the pressure of "properly educating the next generation" are reduced or nonexistent. We are left with a great deal more flexibilty in curricula and clientele, with fewer "big ideas" to consider. In this section, I'll review some current thinking in areas of study which are particularly productive when one attempts to improve adult education.

General Conditions of Learning

To begin, I'd like to distinguish my topic from another, closely-related one. In this section the discussion centres on the conditions which affect learning. These conditions may be external to the learner (environment, social pressure, ...) or internal (perceptions of social pressure, beliefs about success or failure, ...). I will avoid discussing the nature of learning at the level of brain function and the nervous system. Cognitive Psychology is a fascinating area for investigation, but beyond the scope of this paper. In other words, I will discuss learning by discussing its "input/output" rather than by trying to understand the operation of its "processor."

My treatment of the conditions of learning is influenced by the writings of Robert M. Gagne (1970). His ideas are useful for several reasons:

1. Though Gagne refers to adult learners only in passing, many of his conclusions apply directly, and help to focus our attention on important issues.
2. The discussion can proceed using examples familiar to most parents and practicing teachers.
3. The structure advanced by Gagne seems to fit the practical reality of adult education. The developmental psychology school of thought, perhaps best represented by Piaget, finds less fertile ground in adult education.
4. There are behaviorist elements to Gagnes' ideas, in that changes in behavior and performance are used to confirm that learning has occurred. However, he moves beyond programmed instruction to higher levels of learning, while leaving control of the conditions of learning (external and internal) in the hands of teachers and students.

In Gagnes' words, "Learning is a change in human disposition or capability, which can be retained, and which is not simply ascribable to the process of growth." (Gagne, 1970, pg.3)

Learning occurs in steps. Each step is a prerequisite in a heirarchy. According to Gagne, it is this heirarchy which determines what we can learn; we can learn at a particular level if we have the prerequisites, if we have climbed the steps which came before. This idea fits adult education better than the developmental psychology viewpoint.

The heirarchy consists of eight levels, listed and briefly described below. Some levels are of more interest to the adult educator than others, as I will show in a few moments.

1. Signal Learning

We learn to respond to signals. For example, an infant learns that a certain face means warmth, soft murmurings and contentment, and he/she behaves accordingly. Signal Learning is displayed through general, diffuse, emotional responses which are largely involuntary.

2. Stimulus-Response Learning

We learn particular behaviors in response to particular situations. For example, a toddler learns a spoken word in response to a parent's coaching and encouragement. This learning is displayed by more finely-controlled muscular response which is sufficiently precise that "correctness" can be ascertained. For example, "wa-wa" is incorrect while "water" is correct; "contenate" is wrong, "concatenate" is right.

3. Chaining

At this point we can begin to see a pattern in the structure of the heirarchy. Not only do higher levels build on lower ones, but the relation between levels is often organizational. *Chaining* involves connecting various learned responses, so that one stimulus can evoke a chain of responses. It should be made clear that the "trigger" stimulus need not be at the beginning of the chain. Some chains of responses can be activated in many places. This is an important idea to keep in mind when planning an adult education course. Participants will have different "entry points" into the learning.

Examples of chaining include several activities we ofter call "familiar rituals" like brushing our teeth, starting a car, or booting a word processor on a computer.

4. Verbal Association

Learned verbal associations are really chains of stimulus situations and their responses. However, the stimulus is verbal, and hence dependent on the learner's experience. Learning verbal associations without commensurate experience is very difficult, though not impossible. Just ask a person who has "learned" to repair an engine or operate a spreadsheet by being *told* how to do it. The fact that adults have much more experiential background than children makes verbal chaining an important element in their learning heirarchy.

5. Discrimination Learning

You might well be asking when the discussion will come round to *forgetting & interference*. Now that we have built a base of chains of stimulus-response learnings and verbal associations, we can discuss issues of permanence and interference. First some examples of learning at the Discrimination Level.

a. A youngster undertakes to learn by sight the make and model of all 1984 cars and trucks on the road. Here, numerous short chains of stimuli-response situations interact and interfere. Some are selectively forgotten because they are currently irrelevant (perhaps the shape of headlights is not a factor this year), while other connections are strengthened.

b. A novice at a word processing package learns the relative importance of various keystroke sequences. Some are memorized and some are forgotten, to be looked up when the need arises.

It is apparent that Discrimination Learning is built upon the prerequisite of a rich selection of chains and verbal associations. With Discrimination Learning and higher levels, we are firmly in the realm of *intellectual skills*, as opposed to motor skills.

6. Concept Learning

The organizational nature of the heirarchy is again apparent. Concepts are *classifications* of stimuli situations, verbal associations and chains. This might be said to be the first candidate for the descriptor "higher-level" learning because here we encounter more abstraction. It is concept, for instance which separates the idea of "operating system" from its various implementations. Because of their greater experience and command of language, adults are more capable at forming and modifying concepts than are children.

7. Rule Learning

These are not the rules of institutions and judicial systems, they're learned at levels 2 and 3. The rules to which I refer here are *chains of concepts*. An example of such a rule is "When an operating system supports interrupts, the processor can work on other tasks while I/O is going on." Numerous verbal concepts are linked to form this rule.

It is at the Rule Learning level that we encounter one of the more invigorating educational debates: discovery learning versus guided inductive learning. Discovering rules means the learner builds his/her own conceptual chains, as opposed to the verbal chains build by inductive learning. The argument is made that such verbal chains can exist without meaning to the learner.

The issues are much more complex, of course, and one can look forward to continued debate. The importance for us here, is that with adult learners we might be able to get to many rules verbally, utilizing adult experience, but we cannot rely on talking entirely. Adult computer classes probably rely on the lecture mode too much.

8. Problem Solving

Learning to solve problems involves synthesizing existing rules into new rules which fit the problem at hand. This style of thinking is very familiar to adults, because they are the class of learner most likely to combine the prerequisite learning (chains, verbal associations, concepts, rules) with a rich storehouse of problems to solve. Unfortunately, there remains in many adult learners an attitude that everyday problems are unworthy of consideration and that ad hoc solutions which simply "feel right" are inferior to textbook solutions. This tyranny is a carryover from regular schooling, and doesn't belong in a class of "grownups".

The eight levels listed above represent some of the *internal* conditions of learning. The closeness of fit between this heirarchical structure of learning and the real world of teacher and adult student will be tested in Part III.

Attempts to teach a new skill or to expand an old one would be well-advised to do his/her homework. *At what level in the heirarchy is the skill? Do the students have an adequate base of lower-level skills?* For instance, there is little sense in teaching rules when some of the appropriate concepts are missing. This homework is especially important with adult computer classes, which teach a wide range of skills to clients who may have strong backgrounds but suffer from several significant "holes" in their education. One concrete result of this style of thinking is a strong commitment to needs assessment and to student-instructor dialogue in the early stages of a course, coupled with an organization which permits different students to start in different places in the curriculum. "Adults, whose conceptual equipment is already fairly sophisticated, might best learn ... by diving in *somewhere*, ... proceeding in ever widening concentric circles." (Tobias, 1978, pg.159) But I'm getting ahead of myself.

This discussion of learning heirarchies brings out another advantage enjoyed (at least for the present) by less formal adult education. Too often in formal schooling, the idea of a learning heirarchy is used to explain why "you need a B in Algebra 20 before you can take Physics 30". The preceding comments outline a heirarchy of learning which is decidedly different!

There are other *internal* conditions of learning which deserve mention. *Notivation*, for instance, is an essential condition, one regularly wasted in adult education courses. The grade school teacher searching for ways to get her students to pay attention amid small childish distractions might well envy the adult class instructor who looks out over a group of eager, alert, and attentive students who have temporarily and forcibly submerged some *real* grownup distractions. Adult learners are motivated (for various reasons), that's axiomatic. The sensitive instructor *recognizes* this and looks for ways to constructively channel this mental energy.

This awareness can be manifest in a role-change by the teacher, from instructor to facilitator, from oracle to leader (as defined as someone who finds a parade and gets to the front of it). This implies a trust that the students can and will take responsibility for their own learning and an "abdication of the authority generally ascribed to the teaching role." (Darkenwald et. al., 1982, pg 49) This may be difficult for a traditional teacher to accept, and points out a liability (amid all the advantages) of recruiting computer course facilitators from the ranks of professional teachers.

Another internal condition is a *feeling of efficacy*, of competence, of doing something that will ultimately succeed and make a difference. The importance of this feeling to adult learners cannot be over-emphasized. Because many adults begin classes with this sense of efficacy somewhat weakened, it is crucial that their experience in the computer course not further erode it.

More will be said about the *internal* conditions of learning shortly, when I discuss the effects on learning of anxiety and attitude. For now, let us turn to some of the *external* conditions of learning; environmental factors which facilitate learning and which encourage development of the internal conditions discussed earlier.

Arranging these external conditions of learning with sensitivity and care forms the core of an instructor's task. Many teachers pride themselves in their ability to design and modify the external conditions of learning in response to particular situations. This flexibility is a valuable skill, but it should not be used as an excuse for poor planning. Careful design work is entirely feasible for the part-time instructor and follows naturally from an analysis by the instructor of the learning level and prerequisites, and from an assessment of the students.

While it may be true that many external factors (venue, meeting time, ...) are not always under instructor control, a surprising number of them are. Those conditions which primarily utilize instructor skills are outlined below. Once again, Gagne discusses them in the context of regular schooling. I have made some modifications to strengthen their application to adult education.

1. Gaining and Controlling Attention

The adult education instructor who has an inattentive class is in serious trouble, because the situation is almost definitely the result of very poor technique. Adult students have to be severely mistreated by their instructor before their attention drifts. This mistreatment is, however, not uncommon. Adult education instructors will lecture for hours, refer to tiny objects with quick gestures, write cryptic notes on poorly adjusted overhead projectors, move demonstration objects suddenly, spurn animated presentation, and ignore graphics. Adult attentiveness is certainly resilient, but there are limits.

2. Informing the Learner of Expected Outcomes

This is analogous to knowing the rules of the game and what you need to do to win. A clear idea of the goal (perhaps actually *seeing* an example of the expected product) helps the learner to focus effort, reject extraneous and irrelevant stimuli, and measure progress. Too often students are kept in the dark because the instructor just doesn't think about it, or because of concern that clear goals will give away "the answer". This is based on the erroneous idea that the skills to be learned are entirely represented by this one example. Seeing, hearing, feeling, touching a sample answer is a great aid to learning.

A few comments about *verbal* statements of objectives should be made. The best statements are clear and easily evaluated by the learner in terms of his/her own subsequent performance. They stress observable action, use verbs like "draw, identify, compute, produce, ..." and avoid verbs like "know, understand, grasp, discuss, ..."

3. Stimulating Recall of Relevant Prerequisites

This simple review step at the opening of a class session is often omitted or done in perfunctory fashion. The instructor may be in too much of a hurry to get on to new material. He/she is, after all, an expert and there is *so much* to learn. The students may well have been away from "school" for so long that they have forgotten that regular review sessions was the reason some of their grade school teachers made so much better sense than others. This *investment* in review is especially important for adults, who often meet but once a week for classes which involve skills truly foreign to them (like computers).

4. Presenting the Stimulus Situation

This is often the *actual* starting point of a class session. Because adult class meetings are usually longer (2 hours to a whole day) the temptation is strong to present one gigantic multifaceted stimulus situation all at once. More comments about "mind-sized chunks" and regular success will be made in Part IV.

Presenting stimulus situations are what good teachers do best. However, there is a different "flavour" to the job when the class is filled with adults. The stimuli are more verbal, relying on the adults' verbal chains and experience, and are less concrete. This is normal and one of the advantages of the adult context. However, it ought to be kept in mind that *any* new learning by *anyone* has elements which reach way down to the Stimulus-Response and Discrimination level. Such learning is not reserved for children alone! Adult students complain, for instance, about too much jargon. This is a sign that the instructor's analysis of prerequisites for the new skill has not gone below the concept level.

5. Offering Guidance for Learners

Once again, the verbal emphasis grows as students get older. The cautions about over-reliance on "telling" made earlier also apply here. Instructors who take time to prepare reference handouts, who put up posters of important information, who are not averse to using little rhymes as memory aids, who will state "The next bit of material gave me fits when I first saw it" ... they enjoy success, as measured by learning productivity and student efficacy.

The issue of *intervention* arises frequently in all instructional theory. When does a teacher stay back? When does he/she step in? What sort of guidance should be given? With class sizes of 30 or more, many grade-school teachers find these questions somewhat academic. Adult education classes are smaller and less volatile. Combine this with possibilities of peer tutoring, instruction aides, and laboratory assistants, and the possiblities for intervention are much greater.

You may notice that I haven't answered the questions... because volumes can (and have) been written about this. Further investigation is left to the reader. There are however, some further references to intervention in Part III of this paper, where student opinions are presented.

6. Feedback from Learning

The subject of feedback goes much deeper than simply saying "right!" when a correct response or action is encountered. Sometime saying *nothing* is better for adults, especially when the student has a sufficiently clear idea of the goal that he/she is evaluating him/herself. This self-evaluation has another benefit to learning; it is more immediate.

The philosophy that guides many grade school teachers is that success is contagious. There is no reluctance to teach in small pieces, with frequent pauses for assessment and review. There is no shame in making sure that children *feel* successful. Yet, somehow, adults are too often expected to wrench that feeling of success from long streams of uninterrupted content, devoid of any pauses for savouring small successes.

7. Appraising Performance

The emphasis here is on *external* appraisal. "If the learner has been informed of the performance expected at the end of learning, it is desireable that this expectation be fulfilled by permitting him/her the opportunity of checking their performance against an external standard." (Gagne, 1970, pg 317)

The adult context offers several bureaucratic and social freedoms from external standards, freedoms which can be mis-applied. No evaluation nor standards at all is bad, ridiculously easy evaluation and standards is worse. That still leaves a lot of area. Formal tests for professional and trade certification are certainly a fact in some situations, and some computer courses carry optional university credit. However, there is usually much room for an instructor to maneuver between formal tests and non-existent or silly evaluation. My own feeling is showing through: some evaluation should be external to the learner, should be respectable, and should conform to the objective of the learning (*criterion referenced*), and should appear *during* as well as *after* the learning period.

That portion of the external evaluation that occurs *during* learning ought to be examined by the instructor and discussed with the students right away, so that it can affect ongoing instruction. The results of all external evaluation should be used by the instructor as a guide for course improvement. It is an undeniable fact that the course content (be it plumbing or spreadsheets) has no inherent "rightness" which somehow percolates to the student regardless of how the instructor chooses to present it.

8. Making Provision for Retention and Transfer

Transfer can be *lateral or vertical*, and both are important to adult learners, who parachute into a computer course for a short time and them return to work or home and try to transfer their learning to vaguely similar situations. *Lateral* transfer is made by a student who learns Wordstar in a class and then uses it at work to produce some styles of documents not covered in class. *Vertical* transfer is found when the student uses the Wordstar background as a springboard to understanding and perhaps self-learning the intricacies of Lotus Symphony.

How can an instructor "teach for transfer?" One productive area is the choice of examples. Many instructors do not give enough examples because they rob time from the content-driven course flow. However, examples covering a wide range of applications of the learning, along with carefully thought-out negative examples, will greatly enhance transfer of learning to real-world situations.

Part III describes cases of adult students who completed a course feeling quite "charged up," but who encountered difficulty with transfer, even lateral transfer. Inadequate practice time on wide-ranging examples was reported to be the reason. But I'm getting ahead of myself again.

The subject of examples also relates to *retention* of learning. Over and over again, I have encountered adult students who felt they had to try and remember *everything* they saw, heard, and did, rather than relying on familiarity to winnow out the unimportant things. Examples build familiarity.

There are several other issues which Gagne considers, such as *Tutoring vs Lecturing vs Discussion*, which I will include in later discussion. It is time to move on.

Characteristics of Adult Learners and Adult Education

Darkenwald and Merriam (1982) provide us with a workable definition of *adult* - one which is overdue in this paper. "An adult is someone who has left the role of full-time student (the principle social role of childhood and adolescence) and assumed the role of worker, spouse and parent...(for whom) the ordinary business of life continues, and the role of student is subordinate." (pg.8)

Darkenwald and Merrian devote considerable time to a comparison of numerous schools of thought about learning. They tour the ideas of humanism, behaviorism, Gestaltism, cognitivism, developmentalism, and heirarchism. Amongst all these "-isms" we find a discussion of the range of views about the *social responsibilities* of education, from a mirror of society to a source of revolution. Linking these diverse points of view are certain common threads which apply to our field of interest: adult learners. In many cases they apply to *all* learners. In brief they are:

1. "Adults are different from young people.
2. Education is an activity that emphasizes learning rather than teaching.
3. There is some interplay between the intellectual and emotional elements in learning.
4. A primary vehicle of adult learning is the group.
5. Emphasis is placed on the individual as a learner." (pg.70)

The next several pages are devoted to an expansion of these points.

1. An adult's readiness to learn depends in part upon the amount of previous learning. New intellectual skills depend on prerequisite intellectual skills and prior experience. Diversity of experience is a fact of adult students.

2. People learn from the inside out. Learning which directly satisfies ones' needs is most likely to become permanent.

3. Positive reinforcement is more effective that negative. Memories of the latter in school days long past is a common impediment to adult learning.

4. Organization of the learning experience is highly beneficial. A superior method is to proceed from the simple to the complex, from the familiar to the unfamiliar, from area of strength to area of weakness.

5. Adult learning stresses skill development to a higher degree than pre-adult learning. Such learning is enhanced by repetition and attention to the spacing and timing of practice.

6. Practical, meaningful material is more easily learned and retained longer. The "meaningfulness" of material is not intrinsic, but is influenced by the instructor's presentation. This means for instance, that adult education cannot simply copy regular education, which prepares children for adulthood. Adult education ought to assist adults to better perform the roles and functions they have *already* assumed. It also hints at the question of "Why is the student here?" Needs associated with enrolling in a class simply to escape the daily routine or

satisfy a desire for human contact cannot be ignored.

7. While the traditional lecture is most frequently used and *accepted* in adult education, one cannot conclude that passive and traditional approaches to learning are preferred by adult students. Active rather than passive participation enhances learning and retention.

8. Adults also learn co-operatively. They rely on peers to support their learning through constructive feedback in a non-competitive environment.

9. Environmental factors influence learning. Noise, overcrowding, temperature, lighting, ... all can enhance or inhibit learning. So can tension, derision, pressure, and fatigue.

10. Earlier notions that intellectual powers diminish with advancing age are being challenged by research. The emerging picture is one of reduction in some *some* faculties (speed, for instance) but remarkable resilience of faculties which rely on "experience, accumulated knowledge, and the interplay between the organism and the social environment." (J.L. Horn, *Organization of Data in Life-Span Development of Human Abilities*", cited in Darkenwald, et.al., 1982, pg.107) This research might help explain the apparent failure of many current adult computer courses. Instructor strengths (youth, speed, ability to concentrate, ...) are taking precedence over student strengths (maturity, experience, a sense of perspective, ability to work with a group, ...).

The relationships amongst learning, memory, problem solving, and physiology are fascinating, but beyond the scope of this paper.

The points listed above might well form the basis some day of a "Lifelong Learning *Bill of Rights*."

The discussion so far, however, is heavily weighted towards the cognitive domain. The Bill of Rights ought to say more about the *affective* element. Few would deny that feelings and emotions play a vital part in learning. Translating this into actual practice is not so easy, and many opportunities to facilitate learning are lost. "Adult educators do not have a captive audience, nor in most cases (except computer classes nowadays) is a steady supply of learners assured." (Darkenwald, et.al., 1982, pg.115-116). Indeed, many adult students cast their vote against mistreatment by simply opting out.

Let us move on to a discussion of these affective aspects.

Anxiety and Attitude: Effects on Learning

A primary-level school teacher has few philosophical options. Confronted with a swarm of effervescent, self-actualizing minds eager for love, the teacher is driven to humanism. Some might say that humanism drives one to teaching.

If we change the scene to a night class of adults, however, the forces for humanism are less strong, less apparent, but nonetheless existant. No one weeps (we hope!) or whoops for joy; no one kicks their neighbour or kisses the teacher. The emotions are under mature control. But this control is evidence of maturity and a clearer self-concept, not evidence that the anxiety and doubt are absent. Many participants are likely experiencing a confusing mixture of conflicting feelings such as risk-seeking coupled with an aversion to failure. Many have "learned by doing" and are uneasy in a classroom situation where they sense less personal control.

"By the time we are adults we're pretty smart in our special fields, but feel rather dumb when we move outside our *comfort zones.*" (Tobias 1978, pg.24) An experienced middle manager or school administrator cannot help but feel uneasy when transported from a familiar environment where they know their role and make many of the rules, to an environment of fuzzy, developing roles and new rules. "The fear of failure syndrome (has) power as an obstacle to continuing education." (Darkenwald, et.al., 1982, pg.140)

The anxiety needs to be recognized, exposed as normal, and channeled as a positive *enabling* influence rather than a negative *disabling* one. The adult who, for example, finds him/her self back in "school" (a place of painful memories of adolescence) will experience feelings of pain, insecurity, and inadequacy all over again. A female teacher, office worker, doctor or lawyer whose self-concept includes "I'll never understand math!" and whose preconceptions include "To learn how to use computers you need to be talented in math." or "Computers are for boys." ... is likely to approach a computer course with some discomfort.

The various interconnected causes of uneasiness and the treatment of more serious cases are discussed in several books and articles. (Hodges, Kranzler, Speilberger et.al., Tobias) This topic also formed the basis of several fascinating conversations during my interview efforts. I will not discuss causes and treatments in depth, since I am more concerned here with milder cases and their affects on learning.

The instructor can deliberately set out to reduce these anxieties and to channel the tensions. Successful outcomes depend however, on *participation* by the students. This participation can be enlisted by public recognition that people might be uncomfortable and that there will be periods of tension and frustration as new learning occurs. The instructor can offer some basic suggestions for students who wish to reduce simple tensions, but it is the student who must accept and do them.

Rational Emotive Therapy, as described by Albert Ellis and discussed by Kranzler (1974) and Tobias (1978) offers some interesting insights, as well as some student-oriented activities for managing anxiety. Ellis aims at the totality of human emotions and so goes far beyond the scope of this discussion. His premise is that "in spite of amazing progress in other areas, (man) is still not appreciably more emotionally mature, stable and happy than he was in past centuries." (Ellis et.al., *A Guide to Rational Living*, cited in Kranzler, 1974, pg.1)

Since RET aims mainly at adults, there are many points of interest to adult education instructors. The foundation of RET consists of two main ideas:

1. Emotional consequences (anger, hurt, embarrassment,...) are not caused by some external event (an unkind word, a failure,...) but rather are caused by our *beliefs* about the causal event. For example, I might be reluctant to ask a question because I believe other people will think I'm not very bright. I might fear an impending test because I believe that failing it would be a catastrophe.

2. Many of our beliefs about causal events are *irrational*. Kranzler counts eleven irrational beliefs which play havoc with our emotions, including:

   a. One should be thoroughly competent in all respects.
   b. It is awful and catastrophic when things go wrong.
   c. One should suppose the worst and dwell on it.
   d. It is easier to avoid difficulty than face it.
   e. One's past history (accomplishments & failures) is a major determiner of present performance and capabilities.

There are more irrational beliefs in Kranzler's list, but these should be enough to make this point: since we create many anxieties through our irrational belifs, we can attack those anxieties by rationally disputing and demolishing those beliefs.

RET offers some highly-practical participatory activities for people who wish to reduce their anxiety. I'm not suggesting that an adult computer course should evolve into an RET session, but these activities do evoke some ideas for the instructor who is eager to raise their sensitivity and expertise. Consider:

a. learning to identify one's irrational beliefs. Techniques for this include keeping a diary which describes activating events and records "self-talk" and personal feelings about those events.

b. disputing ones' irrational beliefs by carefully dismantling self-talk and feelings that contain "should, ought, awful, terrible,..." and which over-generalize with words like (everybody, always, nobody, never,...".

Evidence that RET is effective is provided by Dr. Kranzler (1974 and interview) who practices it in his capacity as counsellor and educational psychologist.

More evidence in favour of RET, along with a clear corroboration that anxiety is debilitating to learners, is provided by Tobias (1978). Though she concentrates on the causes, consequences and treatment of *mathematics anxiety in women*, her personal experiences and reports of research do nothing to refute the claims made previously in this paper. She recounts some chains of events contributing to anxiety which are interesting, and are summarized below. (Tobias, 1978). Where the word *computer* appears in italics, I have substituted it for Tobias's word *mathematics*.

1. Adults develop simple "systems" to aid memory or as a short cut, (rhymes, saying out loud, moving lips, sketching, miming) but are often ashamed of them (pg.30)

2. It is difficult for a young person to be a beginner. For an adult this requires a special courage. (pg.24)

3. "There are conflicts between the common everyday use of words and their use in *computer* context." (pg 31) "...when people

already feel insecure about *computers*, linguistic confusion increases their sense of being out of control." (pg 51)

4. Paranoia comes quickly on the heels of the anxiety attack. "Everyone knows", the victim believes, "that I do not understand this. The teacher knows. Friends know. I'd better not make it worse by asking questions." This paranoid fear of exposure keeps us from constructive action." (pg.45)

5. "Since only a few people are supposed to have a *computer-type* mind, part of our passive reaction to difficulties in learning is that we suspect we may not be one of 'them'." (pg.47) This irrational belief is strengthened by a teacher who claims an entirely happy history of learning *about computers*. (pg.47)

6. If you don't feel safe, you won't take risks. (more about this shortly)

7. "*Computer*-anxious people seem to have little or no faith in their own intuition. If an idea...or a strategy appears...in a flash, they will assume it is wrong." *Computer-literates* ...trust their intuition in solving problems (and figuring out applications software!) and readily admit that without it they would not be able to do much..." (pg.63)

8. "Many math anxious adults...were frustrated at not being able to have discussions in math class. Somewhere they or their teachers got the wrong notion that there is an inherent contradiction between rigor and debate." (pg.64) (The similarity with the ordinary computer class is obvious.)

9. "Some students cannot put their minds to a...problem, or play

with it for a while, because they assume they are expected to know something...and they've forgotten. (pg.66) (Another irrational belief.)

10. "The goal is...to achieve...autonomy. In the end we can only learn when we feel in control." (pg.69)

11. Of special concern is "how people cope with uncertainty, whether they can tolerate a certain amount of floundering, what happens to (their attitude) when an approach fails, and how they feel about failure. Our expectations...are shaped...by what we *think* we can and cannot do." (pg.91)

12. "Negative attitudes...can powerfully inhibit intellect and curiousity and can keep us from learning..." (pg.96)

13. Learners "need to be self-confident about learning. (They) need to be able to say, 'This particular approach does not suit me. Do you have another?'" (pg.121)

14. *Doing something* minimizes the feeling of helplessness. (pg.123)

15. When people make a mistake in some procedure, they might have discovered the *correct* procedure for some *other* goal. (pg 131) (This is especially true of computer network protocols, operating system commands and programming languages.)

16. "The more experience one has in *computing* and the more varied one's *computer* repertoire, the more...intuitive it will appear." (pg.142)

17. "Individuality should be acknowledged and encouraged, although it plays havoc with lesson planning!" (pg.156)

18. Many problems experienced by adult learners are the simply

result of rusty pipes.

19. "Most educators know that feelings influence learning, but few take time (in) class to deal with feelings. They may think that such a discussion is a distraction from the work at hand. (pg.247)

20. The *talking* process helps people know they are not the only ones to suffer. Moreover it stimulates the recollection which can remove old obstacles to new learning.

21. "Little is gained by taking people who are worried about not doing well in *computers* and simply making them less worried about it. (Such) solace may be necessary, but by itself it won't cure...anxiety. Mastery is what we're after." (pg 249) (This point ought to be carved on a stone tablet!)

22. "Successful problem solvers, we are told, play with a problem... We who are less confident rush for the formula even before we really understand what is being asked for. The breakthroughs in understanding...come suddenly when we realize we have what we need in our heads, if we can just relax and let our minds use it. (pg.269)

The observations listed above ought to be very provocative. It is hoped that they will contribute to the overall goal of this paper, to raise the reader's level of sensitivity and expertise as a facilitator of adult education.

The sensitive instructor is better equipped to build an appropriate climate in his/her classroom. What sort of climate? Details will be found in part IV. At this point, a general description will suffice, and is provided by the Association for

Humanistic Psychology. It is a climate which:

: centres attention on personal involvement of the experiencing person;

: emphasizes the human capabilities of choice, creativity, valuation, and self-realization;

: recognizes the importance of *meaningfulness* in the selection of material for study;

: opposes an emphasis on objectivity at the expense of significance;

: is concerned ultimately with the dignity and worth of the student;

: promotes the development of individual potential.

I suggest to you that adult students in such an environment will learn more, better, faster, and retain it longer. They will also likely be good public relations voices for adult education!

The teacher who creates this climate (with the aid of students, of course) has a wider job description that usually required for part-time adult educators: "...the helper who furnishes a model of 'learner'; the expert who know more...; and the therapist who removes attitudinal blocks to learning." (Kenneth Benne, *Some Philisophical Issues in Adult Education*, cited in Darkenwald, et.al., 1982, pg.57)

The last section of Part II deals with an issue which somewhat unifies the previous discussion - the issue of *Change, and how it occurs.*

The Structure of Change

How is the Structure of Change related to adult education and to computer courses? How is a study of Change going to unify the previous topics discussed here? Consider this:

1. Learning involves change. Change involves emotion, risk, success *and* failure.
2. The learning I refer to is experienced by *both* students and instructors. Both are being asked to undergo change.

An overview of the structure and consequences of Change is interesting to instructors of adults for three reasons:

1. Changes in teacher methods and behavior require the acquisition of new skills.
2. Much of adult education in computers is also oriented towards the acquisition of new skills. (applications programs, for instance)
3. An understanding of the structure of change can help an instructor influence decision makers.

A commonly-held belief is that change and innovation in education is difficult and seldom lasts. "The industrial model of schooling still prevails (for adults, too), relentlessly absorbing each new effort at innovation." (John Goodlad, et.al., *Looking Behind the Classroom Door*, cited in Joyce, et.al., 1983, pg.65) Inservice leaders often notice that teacher-participants do not implement the ideas they were so enthusiastic about during the sessions. Administrators regularly assume the role of regulator and manager, as opposed to instructional leader and change agent. The staples of the curriculum are largely unaffected by change efforts. The education system is viewed as a complex entity virtually impossible to change. This may be true, or it may not. The issue is really unimportant here, because:

1. Our goal is to achieve small, attainable changes in both instructor and student.
2. Research strongly supports the idea that Change has structure, that Change can be optimized, and that it *has happened successfully* in education. "...successful examples of innovation are based on what might be most accurately labeled as organized common sense." (Fullan, 1982, Preface)

The points outlined below are inspired by the writings of many people. Michael Fullan's book (1982) carries a wealth of information, gleaned from many sources. The work of Bruce Joyce et.al. (1983) and a conversation with Dr. Beverley Showers rounded out my "education." Much of their material pertains to school-wide and system-wide changes in curriculum and organization. They also engage in a highly-informative description of the roles of various players in the education game.

My objective is to emphasize those elements which should be made known to leaders or potential leaders of adult education classes. Doubtless, my own feeling of optimism concerning the future of adult education and adult learning will show through. There is no doubt that achieving *good* changes will entail *hard* work. However we may find comfort in the realization that change is inevitable and engaging in *bad* change may be harder!

Here are some thoughts worth considering: (Some quotations have editorial comments added)

1. Stability and constancy are important to students regardless of age. However, this is not a maintenance of the status quo but rather a constancy of *support for change and learning.* In other words, to get the best from students, education ought to constantly nurture creativity with a stable supportive environment. Similarly, to get the best from educational *practitioners* "Innovations, occasionally large but mainly small and (locally) induced need to be normalized." (Joyce, et.al., 1983, pg.79)

2. It requires effort and courage to back away from familiar ways of doing things and ask ourselves where we are going. Harried instructors take note!

3. The normal organization for teachers (including most adult education situations) is cellular. Communication amongst teachers in not well-supported. Teachers identify much more strongly with classroom than system when it comes to improvement efforts.

4. "Relatively few (students or instructors) who obtain a (new) skill ... will make that skill a part of their regular practice. *Not until the coaching component is added* to the equation and used effectively will most teachers (and their adult students) begin to transfer a new model into their *active*

repertoire." (Joyce, et.al., 1983, pg.139)

5. Coaching helps facilitate transfer of new skills, when combined with:

   a. a regular discussion of transfer throughout the learning process; (*examples* in other words)
   b. a frank admission that new practices will often be accompanied by nervousness and reduced effectiveness at first;
   c. a high level of preparation during training. (ie: lots of practice in class)

6. Student achievement is enhanced by

   a. clear goals,
   b. high expectations,
   c. a sense of efficacy by the teacher and student alike,
   d. pervasive caring,
   e. ample practice time,
   f. coherent material,
   g. variety in teacher strategies,
   h. respect for the student as a self-actualizing learner.

(Joyce, et.al., 1983, pg.25)

7. Many major efforts at instruction improvement are aimed at cognitive goals over social goals. The former are more concrete, easier to implement and measure, and somewhat elitist. The latter improvements don't get the support they deserve. (Fullan, 1982, pg.21)

8. "All real change (for instructors and their adult students) involves loss, anxiety and struggle ... passing through the

zones of uncertainty ... the situation of being at sea, of being lost, of confronting more information than you can handle." (D. Schon, *Beyond the Stable State*, cited in Fullan, 1982, pg.25)

9. "The personal costs of trying innovations are high." (E. House, *The Politics of Educational Innovation*, cited in Fullan, 1982, pg.27)

10. "It is possible to change (and learn) on the surface by endorsing certain goals, using specific materials, and even imitating the behaviors, without specifically understanding the principles..." (Fullan, 1982, pg.33)

11. There is strong evidence that adult learners are influenced strongly by ideas from peers and colleagues.

12. "Difficult changes (and learning) ... must be done in a way which maximizes clarity through defining specific components and implementing them incrementally." (Fullan, 1982, pg.59) Learning occurs most effectively when the steps are small.

13. "When an attempt at learning new skills fails, (or falters) the result can be frustration, wasted time, feelings of imcompetence, and disillusionment.

14. "Preoccupation with content ... has resulted in neglect of the interpersonal and organizational aspects of planning for change (and instruction)." (Fullan, 1982, pg.95)

15. "...education pertaining to an innovation must ... move from the concrete to the abstract, from practical procedures and activities to a discussion of underlying principles, rather than the other way around." (Fullan, 1982, pg.121)

Whether you are an adult student struggling to find the time to learn a new skill, or a busy part-time instructor interested in doing a better job, *it is very hard to be a lone innovator.*

This concludes Part II, which focused on some "Productive Areas" of study. The goal of Part II was to outline some topics deserving special attention by adult education leaders, especially part-time instructors. Aside from the factual information and research findings recounted here, I hope the reader has reached this point with a feeling of optimism. Much of what has been reported so far in this paper comes under the heading of *enlightened common sense.* A great deal is known about the four areas outlined in this section, and some clear paths to improvement ought to be apparent.

Part III of this paper will summarize the findings resulting from my interviews.

PART III: RESULTS OF INTERVIEWS

The following section brings together results of many enjoyable hours spent in conversation. When planning this Part, I originally expected to report my findings under the same headings as I used in the literature review (Part II). This, however, proved to be too contrived. Instead, I decided on a superior organization, which will provide better preparation Handbook portion (Part IV). There are many parallels with the material discussed in Part II, but explicit links are not made.

Outline of Part III

Instructor Behavior and Sensitivity

1. Reactions and Suggestions from Adult Students (based on their experiences.
2. Advice from Instructors and Theoreticians.

Content of the Course.

Subheadings 1 and 2 repeated.

Preparation and Organization.

Subheadings 1 and 2 repeated.

The reactions and recommendations of students are covered *first* in each section because they provide the most information. The Advice from Instructors and Theoreticians section is more brief because much of its content is already mentioned by students. In all cases the students and instructors were discussing adult courses about computers.

The general tone of this section (and of the Handbook which follows in Part IV) is deliberately proactive and positive. Little time is spent recounting failures and omissions except when they serve as guides for improvement efforts.

The reader will notice immediately that this section is marked by an absence of numbers and statistical analyses. This was a deliberate choice since I felt the imposition of a questionnaire on the interviews or a scoresheet on the observations would defeat my goal of producing a fairly wide-ranging sourcebook. I ask the reader to accept my assurance that a conscious effort was made to facilitate conversation, not lead it.

Instructor Behavior and Sensitivity

1. Reactions and Suggestions from Adult Students

a. Speed

This topic arose in several conversations, as students complained that instructors talked too fast, moved too fast during demonstrations, and didn't take time to discuss what they were doing and why. One student re-counted being told, in the first few minutes of the first session: "Here, you'll need these (What are these 2 black square things?) but just put one in for now. (One what? Put it where? Why?) Go ahead and turn it on. (Turn what on? How?) Here, let me show you.

(Don't push me away! I can't see what you're doing. Slow down!)" The comments in parentheses are self-talk told to me later by the interviewee. This particular student felt that the instructor knew the "big picture" and had a clear view of what had to be covered but didn't take time to communicate this to her.

:Another person commented on the use of overhead projectors. It was noted that lessons can be "overhead projector-driven, with the instructor zipping through prepared slides at a rate far beyond the students rate of comprehension.

:One student who had attended several courses observed that the instructor was often at least as excited and eager as the student, though for different reasons. This nervous energy was displayed in animated movements, pacing, and fast talk.

b. Jargon

:Jargon of course, is in the "ear" of the beholder. It is really a product of instructors speed of delivery and the student's background and mind set. The feeling came through strongly that instructors often talk too fast and don't relate unfamiliar terms to familiar examples. The result is students who feel "ignorant."

c. Instructor Empathy

:Students were grateful when an instructor made it clear through words and deeds that he/she was concerned more with people than content.

:Any effort by the instructor to "tune in" to the needs and expectations of the students was appreciated. Time spend on student autobiographies early in the class series was considered very valuable.

:An instructor who freely admitted he/she didn't know all the answers, and who reported some personal difficulties understanding some of the class material, was rated highly by students.

d. Fears, Phobias and Misconceptions

:An instructor who talked openly and honestly about student misgivings was highly regarded. A major (and growing) source of uneasiness reported by students was prior experience with computers at their workplace . This experience often left them muddled and nervous. Previous school experiences were also a negative influence at times.

:Several particular issues arose in conversations.

-Conflicting feelings of apprehension *and* eagerness.

-Unfamiliarity with a formal learning environment and with being on the receiving end.

-Concern that errors can cause permanent damage to equipment.

-The link between genius and computers,

-...between males and computers,

-...between math and computers.

-...between failure at a task and diminished self-worth.

:Some women I interviewed, besides voicing thoughts like those reviewed above, related these too:

-"If something stops working at home, I wait until my husband comes home. He'll poke around and search for the problem."

-"When something gets broken, I'm the one who picks up the pieces and cleans up the mess."

-"Broken things are a source of pain for me."

-"I felt myself blush with embarassment when the computer screen showed 'No,no,no! That's not it!'. I forgot that computers don't know what they're saying."

The reliance on male instructors, the aversion to mistakes, and repression of curiosity are understandable. Students expressed approval when an instructor took time to discuss these myths.

:One student recommended that instructors ought to seek out and enroll in courses involving totally foreign topics, to recapture the "novice" feeling.

e. Questions, Mistakes and Interventions

:All instructors were reported as willing to answer questions; however question-answering proved problematical for many students, who reported feeling bored while the instructor engaged in a long winded answer. The alternative of answering briefly or making a commitment to answer privately later was preferred.

:Two students related situations in which their instructor was so eager to answer questions (& get on with the content) that he didn't really listen to them at all. As a result, his answers often missed the mark. The question was seldom repeated.

:Simply *saying* "It's all right to make mistakes." wasn't enough to reassure students for long. The instructor had to model the behavior by not taking control when the student got him/ her self into a problem situation on the computer. A patient facilitator who helped in the diagnosis of the problem, who prompted without taking over, was preferred.

:Also singled out for approval was an instructor who met the fear of making mistakes head on by deliberately doing the "wrong" thing several times during demonstrations and who *modelled* curiosity, the normality of error, and graceful recovery. Students reported that the behavior modelled by the instructor helped them to relax and to experiment, with less fear.

:A group of interviewees who were learning specific applications packages for their job suggested that early practical sessions should consist of "read-only" material which could be viewed and explored but not altered, even by accident. This, they felt, would reduce concerns about "messing up" company records. Subsequently, practice sessions would move to "trials," with real data but no actual changes to computer records.

f. Atmosphere

:Several students reported viewing the course as a "time out" from regular duties and the daily grind. Another person viewed her computer course as an opportunity for socialization and personal growth. Several students indicated their (company-sponsored) computer course gave them a chance to get to know co-workers better, brought a heightened appreciation of the work they did, and opened some lasting lines of communication. One student took courses involving computers for no immediate reason, viewing them as a good investment. These various reasons did not mean a reduction in motivation, but rather an appreciation of instructor who fostered a relaxed and unhurried atmosphere, with time for humour and personal interaction.

g. A Sense of Ownership

:Student participation in at least some elements of planning for the course resulted in heightened desire to work hard and achieve. This was especially noticeable when students were asked for their preferences regarding content and instructional style and when *their responses brought change in the way things were done.* Several student indicated that regular polling by the instructor during the course helped them get the most out of the sessions, because they felt they had some "say" in the choice of material.

2. Advice from Instructors and Theoreticians

a. Speed

:Control your speed by controlling your zeal. Be positive and energetic, but be aware of the differences in assimilation rates between expert and novice.

:Students ought to be allowed time to *savour* successes.

b. Jargon

:Jargon tends to mushroom. It first prompts questions from students and then reappears in the instructors' answers. The problem compounds.

c. Instructor Empathy

:Be aware that students might publicly attribute their lack of success to *lack of ability* (a socially more acceptable attribution) when the real reason is *lack of effort* (a socially less acceptable attribution).

:Be prepared to question *your* methods if the class is not lively.

:Recognize that discomfort and tension are an inevitable part of learning and the instructor's job is to help students push through it, to comfort *and* new skills. Be unabashedly positive about your students. Tell them they're achievers.

d. Fears, Phobias and Misconceptions

:Show students early how to correct typing errors and how to reset the computer.

:Use techniques which allow students to experience their worst fears about computers vicariously. For example, you might say: "I'm going to press the wrong key now. You'll likely do this accidently sometime soon, and you'll feel embarrassed because the computer will beep."

:Don't ignore anxieties. Bring them out into the open. Identify worst fears and then demonstrate graceful recovery from them.

:Avoid adding to student's "baggage" of myths. Try not to be catastrophic. Avoid statements like: "Never, never, never put your disk on the monitor! That'll destroy everything!" Instead, be reasonable: "The magnetism around the monitor may affect your disk. It's not advisable to lay it on top of the monitor."

e. Questions, Mistakes and Interventions

:Try not to let a few question-askers monopolize time. Encourage "keeners" to get together later. Delay long-winded replies until after class.

:Don't be alarmed if only a few people ask most of the questions. Instead be concerned is only one person is listening to the *answer*. If this happens, your answers are likely too long and boring.

:Errors and foulups can be minimized, but not completely prevented. Students must experience some foul-ups, anyway.

:Anticipate student errors when you can, and model the correct attitude towards them. For example, there are always several ways through a problem. Experts know this, and take time to "massage" a problem into a form they're comfortable with. Experts also don't brush errors and unexpected outcomes aside but instead examine them for clues. Try to display this behavior in your demonstrations, especially when unexpected outcomes happen to you!

:Stress the virtues of *partial* success. Many pilots display a good grasp of this idea with the expression "Every landing I walk away from was a *good* landing."

:Detach ego from errors by giving students some complete procedures to study, some of which include deliberate errors. Ask the students to find *your errors*, correct them, and test their corrections on the computer.

:Make some of your interventions positive, rather then always responding to trouble. Give praise and make it specific. Privately, subdivide the skill you are teaching into small sub-skills. Then use these sub-skills for selective praise to individuals.

:When intervening, avoid long explanations, but resist the urge to jump in and take over with a quick fix to the problem. Be a facilitator.

:Don't hesitate to say "I don't know."

f. Atmosphere

:Be relaxed and approachable, but maintain your standards. Students respect reasonable standards of punctuality, for instance.

g. A Sense of Ownership

:Your aim is not to fill your students up with information. There's too much of it anyway. Your job is to empower students to learn more on their own. They must *own* their new knowledge and skills if they are to use them independently.

Content of the Course

1. Reactions and Suggestions From Adult Students

a. Demystification

:Many students reported being somewhat daunted by the mystery of computers. This was reduced by an early discussion of *basic* and *non-technical* subjects related to the care and use of equipment.

:The opportunity to actually handle some of the parts provided a sense of control. A technical explanation of their function was counter-productive.

b. Keeping One's Perspective

:Students expressed appreciation for regular reminders that they didn't have to remember everything, that concepts and mind set were more important than details.

:Regular reminders that they already had important skills and knowledge related to their jobs was helpful.

:The intensity of the computer class seemed to influence students towards concentrating on details of the unfamiliar technology instead of concepts. Regular reminders of the real world were important.

c. Sensitivity of Content to Needs

:The student biographies, mentioned earlier as a positive influence, also appeared in discussions about *content*. Students expected that after being asked what they were most interested in learning, the content would reflect their replies. It often didn't. Some students accorded special praise for an instructor who could put effort into satisfying *student* needs even if it meant weakening his/her own central role.

d. Jargon

:This was the most talked-about subject. Most students cited *too much jargon* as a major source of confusion. Strange new names were given to many things that already had perfectly good ordinary names.

:Many questions were not asked because students felt they didn't know the appropriate words. They felt that ordinary words were inadequate.

e. Difficulty of Material

:Despite frequent calls for a brake on the amount of material, there was definitely no shrinking from challenge by the students I interviewed. Challenging assignments were viewed as a positive experience when accompanied by adequate reference resources, time, and a chance to interact with other students.

:Drill and practice was considered important, but no one indicated it should form the entirely of students' working time.

f. Practice and Hands-on Time

:Without exception, students considered adequate practice as an integral part of the course content. They reported various influences which worked against adequate practice. The one singled out for mention here is simply that the content of the course did not allow for it. Instructors seemed determined to maximize *exposure* to many things, often at the expense of *understanding* of anything.

:Private, low-pressure, no-interruption time for hands-on practice was prized by students.

:Specific small practice assignments which accorded rapid feedback were rated highly.

:Several interviewees indicated that their instructor erred in assuming that the students would/could practice at their place of work. When this was tried, students expressed concerns that they would "mess up" the computer at work, and they encountered trouble keeping the focus of the practice assignment. Others cited pressures of family and other "adult" responsibilities which eroded possibilities for spending extra hours at the office.

2. Advice from Instructors and Theoreticians

a. Demystification

:Remind students that computers were designed and programmed by people. Error messages are created by people, not independently by computers.

:Select your software with an eye to user-friendliness, especially good error-handling. Include some graphics and sound in your early demonstrations and practical sessions.

:Connect new terms with everyday items. For example, a floppy disk can be compared to a piece of plastic covered with rust...a silicon chip to a piece of refined sand.

b. keeping One's Perspective

:Remind students frequently that *many* trials are normally required before a new skill is learned and for the required mental pathways to become "well-travelled."

:Relate each new topic to your course outline so students can see their progress.

c. Sensitivity of Content to Needs

:If the format of the course permits variablility of evaluation options, be flexible. Some students will need grades, some will prefer the pass/no pass option. The grade option should have some effect on the content, but standards should remain respectable. Remember, your students are eager to work.

:Try to *show* your evaluation as well as talk about it. Show projects and assignments from previous classes. Discuss former tests.

d. Jargon

:Don't spray words at students, expecting them to stick.

:Deal individually with students who are short of basic entry-level vocabulary for your course.

e. Difficulty of Material

:Take care to identify for yourself the basic minimum skill level required for subsequent individual learning. Don't keep this a secret - tell your students.

:Homework, carefully selected to suit each student, is a good vehicle for raising skill level while helping students clarify their own individual needs.

f. Practice

:Use *more* examples than you do now. Show the whole range of possible positive outcomes as well as selected negative outcomes.

:Deliberately include some practice exercises which are short some essential information. Explain to the students that their job is to first identify the missing information, then locate it is reference manuals, and finally to do the assignment. This is good practice for future independent learning.

Preparation and Organization

1. Reactions and Suggestions From Adult Students

a. Advertising

:The link between the advertising for a course and the actual content and organization was considered to be poor by many students. Some advertisements were vague, some were too brief and some were just plain wrong. One student suspected her instructor had not read the course description contained in the calendar, thereby missing an opportunity to learn what the students had read and might be expecting. Another person pointed out the advantages of brief meetings between the instructor and individual students well before a course begins.

b. Orientation and Atmosphere

:First impressions were reported to be important. Students appreciated a relaxed atmosphere, especially at the very start of the course. Some students recounted courses in which the instructor was available for an informal chat and some private questions before the formal start of the class. Others told of instructors who were rushing about making last minute preparations, and were much too harried to talk. Students indicated they preferred some time to "acclimatize" to the new surroundings, especially to the computers.

:Two interviewees indicated they had attended courses in which the instructor had arranged to have the computers turned on and "doing something" when the students first arrived. This was well-received.

:A brief overview of the class was appreciated, especially when a written copy was accompanied by a brief verbal description. However, negative feelings resulted when the "brief introduction" dragged on for an hour or more while providing "nothing really useful."

c. Pairing and Grouping

:Only a few students indicated negative feelings towards pairing. They felt it held them back after the initial stages of the course. Pairing was viewed positively from a socialization point of view by all interviewees.

:Most students favoured pairing for most of their course time, especially when it was not viewed by the instructor as a necessary evil.

:Larger grouping for assignments was rare, but the few students who experienced it liked the idea. Group work was viewed as helpful for perfectionists who were likely to become involved in no-win contests with a computer. One student expressed positive feelings toward friendly competition amongst groups.

d. Prerequisites and Review

:Most students indicated that their instructors assumed they knew more than they really did, causing feelings of "being put down and dumb." Instructors who took time to assess student knowledge beyond a perfunctory treatment were very highly regarded.

:Review was a prized but rare commodity. Several students indicated they forgot a lot between class meetings, and that their instructors were not sensitive to that. Some instructors conducted laconic reviews in a condescending manner. Any sort of positive "warm up" activities preceding new material, was appreciated.

e. General versus Specific.

:From the standpoint of preparation and organization, students indicated that too much teacher effort went into preparing for general, jargon-filled lectures, and that these occurred too soon in the course.

:Possibly because they had a grasp of general principles, most instructors *started* with general-type lectures, and later proceeded to specifics. The opposite (specific to general) builds on student strengths and encourages early success.

f. Facilities and Assistants

:Absence of "creature comforts" was mentioned frequently, including: difficulty reading overhead projector screens, no room to put books or to write, crowding, uncomfortable seating and poor ventilation.

:A student described a course he attended in which the "lecture area" was located in one part of the room while the "practice area" with computers, was located in another part.

:Several expressed positive reaction to classes which held their first meeting on some "neutral ground" like a lounge or classroom away from the computers.

:Another person indicated appreciation for some pleasant music in the room before class time, and for seating arrangements other that regimented rows.

:Lots of extra help was appreciated, especially in the early practice sessions. Extra laboratory assistants and peer tutoring arrangments were described.

g. Practice

:Students expressed appreciation for practice assignments and examples which were related to their actual day-to-day work situations. Many felt there were not enough examples.

:Practice assignment organized into small steps, offering frequent little successes, were viewed positively.

:Hands-on practice, free of mysterious glitches, and lots of it, was universally preferred.

:Instructors who interrupted practice sessions for announcements and corrections weren't highly regarded.

h. Instructional Materials.

:Handouts were rare but appreciated by students. Special preference was indicated for *reference* materials, which reduced the need for scribbling notes during lectures.

:Several successful utilizations of a projection television for "live" demonstrations were reported.

:Many students indicated their instructors were insensitive to the difficulties encountered by a student who is trying to to listen to a lecture, watch both a video screen and an overhead projector screen, type and write, all at the same time!

i. Timing

:The issue of candor about length of lectures was mentioned by several interviewees. They expressed relief when an instructor was realistic about how long he/she was going to talk, and who allowed time for students to get comfortable before beginning.

:Some students reported that their classes were too far apart, (once a week), too long (three hours), and too late in the day for much productivity (late afternoon or evening).

:Courses offered during summer vacation time were viewed as being more relaxed and positive experience.

j. Wrapup

:A few students indicated they had experienced some activities of a "closure" type at the end of class or at the end of a course, and that it was very helpful in avoiding a sense of discouragement at how much was left to learn. Displays of student work and class wrapup discussions of past learning and future goals were described.

:Other students indicated that their classes simply faded away.

k. Contact and Coaching After the Course

:Two students maintained their pair relationship after their course concluded. They indicated that the shared responsibility for achieving actual implementation put pressure on each of them separately to "get going" rather that let the enthusiasm die.

:Continued peer coaching was rated highly by students who experienced it.

2. Advice from Instructors and Theoreticians

a. Advertising

:Take special care with the advertising copy. It must be clear and re-assuring to counteract media advertising.

b. Orientation and Atmosphere

:Pay attention to creature comforts. You may be too "pumped up" to notice heat, noise, crowding, uncomfortable seating, or poor lighting.

:Be ready for class with preparations done well ahead of time so you can greet students as they arrive.

:Don't leave early arrivals to wander around looking at a bunch of dead machines, anticipating the worst, waiting for class to begin. They are not likely to be as impressed by the hardware as you think. Give them something to read, or better yet, something to watch on the computers. If possible have examples of student work from earlier classes running on the computers

:Use name tags. Use tent-shaped cards with students' name of top of monitors. Identify students by name, always.

:Take time to establish your credentials and to give an overview of the course.

c. Pairing and Grouping

:Encourage interpersonal interaction. The computer activities alone do not do this. Encourage pairing, especially during early practical work. Allow students to move to their own computer (if possible) later when their confidence level allows.

:Pairing may continue, by pairing machines rather than students.

:An opportunity to give voice to irrational beliefs is important, and group work facilitates this.

d. Prerequisites and Review

:Review, review, and review.

e. General versus Specific

:Start on familiar ground and work from there.

f. Facilities and Assistants

:Arrange work stations so each student can see someone else's monitor screen as well as his/her own. The instructor should be able to scan all screens quickly and easily.

:Utilize quicker students and those with higher entry-level skills as peer tutors. If you don't overdo it, they'll gladly help out. It's a good way to learn for tutee and tutor.

g. Practice

:Early practical work ought to maximize success. This can be done by providing students with models to follow.

:Don't rely wholly on the keyboard for early practice. Consider software which uses a joystick, tablet, musical keyboard, or microphone.

h. Instructional Materials

:One of the aims ought to be to produce students who *act like experts*. When a novice hits a roadblock he/she is more likely to go blank and leave resources unused. An expert, on the other hand, stimulates him/her self with questions. A valuable reference handout for novices would be one with several general-purpose "prompting" questions.

:Use reference-type handouts liberally and have lots of extra copies. Encourage students to write notes on the handouts. Use a "highlight" pen on students reference sheets as you give advice and respond to questions during practical sessions.

:Try to replace most of your lectures and verbal walk-throughs with handouts. This frees you to talk to individuals and frees students to work at *their* pace, not yours.

:Consider printing handouts on pastel coloured paper. It's effective!

:Appeal to more than one learning style by utilizing a *variety* of instruction aids including manipulatives, film, videotape, pictures, audiotape,...

i. Timing

:Limit class meetings to one hour, and meet more often.

:If you must meet for three hours, give the class a break at least every hour. Remember, you are walking around and more active than your students. Encourage them to leave the machines and rest their eyes and their brains. Provide a refreshment area.

j. Wrapup

:Regularly remind students of their progress with a brief activity at the end of each class meeting. For example, have them write the numbers 1 to 10 on a piece of paper, and then respond "yes" or "no" to ten statements you make. Each statement highlights a "small success" from the session's work. Activities like this combat the feeling that "There's so much more to learn and I haven't done anything!"

:Make sure students never leave class without something tangible to take with them, such as printed samples of their work, a vendor's catalog, a magazine to look through. Impressions, feelings, visual and aural memories and scrawled notes are important but not enough.

:Have a "graduation exercise" in which students are encouraged (though not required) to show samples of their work.

:Provide references and connections for further training and to encourage peer coaching after the course concludes.

This concludes Part III, in which I reported on my interviews with adult students, instructors and theoreticians.

All that remains is Part IV, the Handbook. This final section will collect together the points made in Parts II & III, with some additional information gleaned from my own experience and from my observations of adult computer courses (see Appendix 2).

PART IV: HANDBOOK FOR INSTRUCTORS

The preceding Parts of this paper have established the foundation for this final portion.

Part I outlined the present situation in adult education especially as it relates to courses about computers, and discussed the best approach to improving the situation.

Part II described four topics judged to be especially productive when improvement of adult education delivery is the goal. The topics were:

1. The Conditions of Learning;
2. Characteristics of Adult Learners and Adult Education;
3. Anxiety and Attitude: Effects on Learning;
4. The Structure of Change.

Part III reported the reactions and recommendations of adult students, as well as advice from instructors and theoreticians.

To this point then, I have tried to establish the conviction that there is a strong base of theory, of research and of pragmatic "folk wisdom" which supports the assertions which follow. This will explain why the tone of this section appears somewhat authoritarian. When for instance, I write "Be available for informal greetings and a chat as students arrive.", I do not mean this is a law of nature nor the gospel according to Allen. Such statements reflect the facts revealed in Parts I, II, and III. Admittedly, my own personal experience and observations enter into the picture as well.

CAUTION

The following material is meant to be used as one would partake of a smorgasbord. Pick and choose ideas that are appealing to you and which apply to your situation. Don't attempt to implement too much at once. Some ideas will take more effort to develop than others. Make your goal quality, not quantity. The instructor who could someday implement *all* the recommendations in this Part would deserve a medal (and would quite likely get one)!

There is very little said here about actual *content* of a course. The suggestions relate to the *preparation, delivery and post-delivery* phases of instruction.

My goal is to improve instructor effectiveness by raising sensitivity. It is assumed that the instructor brings with him/her teaching experience, organizational ability, and knowledge of the particular topic.

The suggestions which follow are deliberately brief and to the point. For expansion, explanation and evidence turn to Parts II and III.

Outline of Part IV

A. Suggestions for One or Two Months Before the Course Begins.
B. Suggested Actions a Week Before the Course Begins.
C. Things To Do in the Hour Before the First Meeting.
D. Suggestions for Action and Behavior as Students Arrive for the First Meeting.

E. Important Activities During the First Fifteen Minutes of the First Meeting.

F. Things To Do During the First Hour Or So.

G. General Considerations for the First Few Class Meetings.

H. Hints for the First and Last Few Minutes of Each Meeting.

I. Suggestions For the Final Class Meeting.

J. And Life Goes On...

Subheadings will not be used because of difficulty with classifying the material. There is however some organisation. It would be best to read *all* the suggestions in a group before choosing a few.

I'm assuming that the courses you'll be teaching extend over several weeks. If there is only one or two sessions in the course, some ideas presented here will not apply. Many of them will, though.

A. One or Two Months Before the Course Begins

- Plan your course well in advance.
- Decide on general, broad objectives.
- Identify the essential skills you're aiming for with the course. These ought to be the skills necessary for future independent learning by students. These skills form the core of your instructional plan.
- Break the general objectives into many small specific skills or performance goals. Print these on a handout for students.
- When writing objectives, use specific *verbs* which point to measurable and observable performances and behaviors. For example: "draw, identify, compute, assemble, ... " are better than "know, grasp, understand, ..."
- Keep the *amount* of material in your course under control. There is much to learn, but it is better to graduate students who are confident with moderate knowledge. Avoid brief "exposure" lessons. Instead, provide sources of information on topics which are interesting but not essential at this time. Sources include magazinees, books, and referrals to resource people.
- Identify the level in the learning heirarchy of each skill or performance. Identify the appropriate prerequisites.
- Meet individually with students who plan to take your course. Assess their "entry points" into your curriculum.
- Assess the strengths of the students. What do they already know about the topic. What skills and knowledge do they have that can form a springboard to new learning?

- Be alert for gaps in a student's general knowledge. The educational history of each person will be different and all will be unlike yours.
- Plan to teach *from* specific *to* general. Remember, only you have general knowledge of the topic. To get students to behave like experts you must build on what they know now.
- Plan for teaching missing prerequisite skills for each of your specific objectives. Do this even if you aren't sure of the skills students will bring with them to the course.
- What are the grading options? Consider different requirements and different evaluation techniques for students taking different grading options.
- If formal evaluation is expected (for some certification or grade option) then plan it carefully. Make your tests and graded assignments regular and short. Make certain that evaluation matches your specific goals. (*criterion* referenced)
- Take time to select user-friendly software and make sure your copies work.
- Become thoroughly familiar with the software you're going to use.
- Look for software that utilizes skills other than typing. For example, some packages utilize joysticks, touch tablets, microphones, etc.
- Try to use different output devices. Consider printed output, voice synthesis, music, etc.
- Look for alternatives to lectures for presenting information.

Capitalize on the motivation of the students by stressing participation, interaction and activity. This will reduce your role as an oracle, replacing it with a role as facilitator and coach.

- Adults are more sophisticated verbally, and we rely on that fact quite a lot. Remember however, that lower levels of learning (Stimulus-Response, Discrimination,...) are important when new skills are being learned. Don't rush through practical sessions just so you can *tell* them more.
- Plan practical assignments carefully. Try to make them short, with clear outcomes.
- Try to make assignments which relate to students' experiences and build on their strengths.
- Be careful of depending too heavily on typing skills. Many students will type less well than you do. Most of them will be mystified by the strange keystroke sequences required by applications packages and operating systems. These skills will develop naturally. All that is required is a basic introduction and regular practice.
- Create some assignments which contain an error or are missing a piece of information. The student's task is to find *your* error, correct it and test the solution on the computer.
- Make up *more* assignments than you think you'll need.
- Homework assignments are fine, but be wary of too much dependence on computer work between classes. Many students do not eagerly seek out a computer on which to do their

homework. There are many *good* reasons for this.

: Think about examples. Decide on positive and negative examples. Select positive examples which range widely over many possible outcomes.

: Make up more examples than you ever have used before. Then make some more.

: Prepare handouts whenever possible. Print lots of extra copies.

: Use pastel coloured paper for handouts.

: Novices often get "stuck" when they encounter a new situation, while experts prod and massage a problem until they see a way to proceed. Prepare a handout with some general questions to help novices to "behave like experts." Some sample questions:

"What did I do just before the roadblock occurred?"
"What did the computer do to tell me there's a problem?"
"Has this happened before to me? ..to anyone else?"
"Do my references say anything about this?"
"Is this problem worth spending more time on?"
"Can I describe the situation briefly in writing for later study?"
"How can I recover from the situation?"

These questions and others will help the students do *do something useful* when problems occur.

: Look for new ways to present material. Consider video, film, slides, pictures, overhead projectors, demonstrations, guest speakers & field trips.

: Plan some demonstrations in which you can show correct behavior when unforseen events occur with the computer.

- Design demonstrations which allow you to model curiousity, exploration, and playfulness when learning about computers.
- Too often, an overhead projector becomes a dominant feature of a class, especially if the instructor is oriented towards lectures and note-taking rather than participation and discussion. Use the overhead as a *supplement*.
- Collect many borrowed & giveaway items for later distribution or loan to your students. Look for brochures, catalogs, magazines, books, ...
- Advertise early and widely.
- Include a brief but concise course outline with advertising copy.
- Try to be clear about your expectations regarding prerequisites.
- Describe briefly but clearly the learning outcomes you plan for.
- Be sure to read all advertisements for your course. It will give you clues about student expectations.
- Arrange for laboratory assistants, at least for the first one or two class meetings. Recruit from the ranks of your former students.
- Collect supplies and audio visual equipment. Be sure you have the necessary power cords and replacement bulbs, etc.
- Think about your standards regarding issues like punctuality, smoking, refreshments in the computer area, etc.
- Explore the possibility of meeting more frequently (more than

once a week, for instance) for shorter periods (less than two hours.

: Can you meet earlier in the day? (earlier than late afternoon or evening)

: Enroll yourself in a course involving a topic that is totally foreign to you and which involves working on a piece of equipment you regard as a little mysterious. For example:

- Motor Repair
- Welding
- Plumbing
- Electrical
- Digital Electronics
- Sewing
- Cooking

The aim is to recapture the feelings that accompany being a novice in a group of strangers.

B. A Week Before the Course Begins

: Meet with your laboratory assistants to review your plans and expectations.

: Impress on lab assistants the importance of positive feedback to students.

: Remind assistants how important it is to circulate amongst the class and to be alert. Adult students will often not call for help until they are frustrated. This impedes learning.

: Prepare a handout of students' names and phone numbers (except unlisted ones). Leave enough space after each name for students to write brief notes.

: Keyboarding skills present a special roadblock to many adult students, especially executives. The location of keys, the names of special symbols (caret, backslash, asterisk, ampersand, ...) and correct operation of the shift and control keys are all problematic. Take time to make an overhead transparency or large poster showing an exact copy of the computer keyboard layout, and the names of special symbols.

: Many instructors and students benefit from the advantages offered by an overhead projector. However, they can also make bad technique worse. If you are preparing overhead slides, keep them uncluttered. Don't cram them with information for students to copy. Use them as signposts to guide your remarks and keep you "on track".

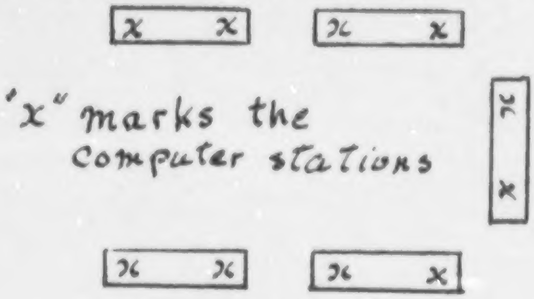
: Take some time to think over the early assumptions you'll be making about the students. These assumptions might change as the course progresses, but the preconceptions you have *now* will influence your approach during the first few hours at least.

: If most of your students are coming from one organization there will be some special group processes taking place which will affect the atmosphere. Try to be sensitive, for instance, to the effects generated when a mailroom clerk is working at a computer and his/her neighbour is the firm's chief accountant.

C. The Hour Before the First Meeting

- Arrive early.
- Put up signs directing students to the classroom or lab.
- Set up separate areas for lecture-discussion and for practical laboratory work. Use two parts of one room if possible.
- Arrange the computers so you can scan all the screens quickly during practical sessions.
- It's a good idea if computers are arranged so that each student can see other screens beside his/her own.

  For example:



- Check that the computers are operating properly. Boot them with a friendly piece of software. It may be interactive or not.
- Wipe off the computers and the monitor screens.
- Check screens for glare. Do all the lights need to be on?
- Distribute software disks and handouts.
- Set up a computer especially for demonstrations, in the lecture-discussion area. Use the largest screen possible, or a television projector.
- Set up and *check* other audiovisual equipment.
- When available, use tables rather than single-person desks for the lecture-discussion area.
- The desks and tables may need cleaning.

: Try to insure that students have ample room for books and supplies in both the lecture-discussion area and the lab area.

: Arrange tables or desks in both areas as informally as space will allow. Avoid crowding.

: Prepare the refreshment area and equip it with comfortable seats and magazines. If possible, locate it *apart* from the classroom or laboratory.

: Be sure there is somewhere for students to put their coats.

: Air out the room if possible.

: Warm up the *atmosphere* of the room. Put up some posters and samples of student work. Spread around some magazines and books. Bring a radio or tape player for some relaxing music as people arrive. Lower the lights a little.

: If you don't mind students contacting you between classes, put the necessary information on the blackboard.

: Wear a name tag.

: Relax a while before students begin to arrive. Your busy preparations and anticipation of the fun to come will have generated some nervous energy.

D. As Students Arrive for the First Meeting

: Station yourself close to the door as students arrive.

: Greet each arrival personally and introduce yourself.

: Ask each student their name and fill out a name tag and tent card. (The latter is simple a folded card which stands on top of their monitor so you can address them by name at all times.

: Be approachable. Initiate conversations and "small talk." Show an interest in students as *people*, and not merely vessels to be filled up.

: Students will have various motives for enrolling in your course. Some of them will surface in later discussions, others won't. Subtly let people know you're aware of the possible existence of private motives through you attitude. Some examples of private motives are:

- Time out from the daily grind at work.
- Something to fill in leisure hours.
- Unemployed and nothing much else to do right now.
- An investment for some possible future.
- Because a friend came.
- Because of a sense of parental obligation.
- Just curious.

: Most of the students are giving up something in order to attend your class. Be sensitive without being apologetic.

: What is the male-female ratio? In may cases, men will heavily outnumber women. This presents special problems for the minority. Avoid anecdotes which link women to computer catastrophes.

: Help students acclimatize. Point out the handouts, refreshment area, and restrooms. Give them time to get used to the place. They may not have been back to school for quite some time!

E. During the First Fifteen Minutes of the First Meeting

- You'll likely be somewhat nervous and emotionally "up." This often results in fast talk, fragmentary sentences, quick movements, pacing, and failure to allow enough time for students to absorb what you are showing them or telling them. Take a few moments to relax.
- SLOW DOWN. Whatever speed you are talking at, it is probably too fast. Speak slowly. Pause frequently. Don't let brief silences intimidate you.
- There is no need to hurry into a content-related lecture. Spend some time now to attend to feelings and attitudes.
- Avoid doing administrative activities at this time.
- Welcome the students and confirm the name of the course, the times, and the regulations regarding smoking and refreshments.
- Introduce yourself and your assistants. Avoid lengthy lists of credentials. *Do* mention any connections you have with the group. For instance if the audience is comprised of teachers, let them know if you are a teacher, too. Your assistants might be "graduates" of previous courses.
- Describe the course briefly, referring to a much more detailed handout. This handout is the road map your students will use to measure their progress and your effectiveness.
- Clarify grading options and policies so students know where they stand. This can be included on your course outline handout.
- Stress the *practical* aspects of the course. Assure

students they will be learning skills that will be useful outside the class (assuming this is true of course!).

: One common student misconception should be dealt with *now*. If the course is oriented towards applications packages, briefly discuss the differences between *programming* a computer and *using* one. Many novices will equate computers with programming. They need to be told that success with applications software depends more on a clear idea of one's requirements than on an intimate knowledge of computer programming.

: Resist the urge to say too much. You can *model* much of what you are tempted to say. For example, encouraging questions is much less effective than answering them in a caring and sensitive manner.

: *Your* talk should occupy only five minutes or so. The remainder of this opening fifteen minutes should be spend *listening*.

: Invite students to introduce themselves and comment on things like their job situation, professional experience, computing experience, their expectations of the coming course and why they enrolled in it. During this time, listen intently but don't comment. Include yourself in these "autobiographies." Take care not to rush through this activity. It is important.

: Usually, efforts to get students "involved" are abandoned in the first few minutes of a course. Most adult students don't respond immediately to requests for opinion, suggestions, or information. Most instructors are quite intimidated by pauses when the group is slow to respond. Be resolute. A fifteen second silence is *not* long. This will quite likely be the result at first, until you are successful at breaking the ice.

: Asking students to *write down* their biographical information and their expectations is a good idea, but don't do it in class time. Provide them with a prepared form, containing some general headings, and assign it for homework.

: *Use* these verbal and written responses to identify specific strengths of individuals. What do they already know how to do? What are they already proficient at? This information will help your teaching to progress from specific to general topics.

: Use this verbal and written information to compare where you are going against where the students *want you to go.*

F. During the First Hour Or So

: Serious harm can be done if you launch into deep monologues at this point. Students will simply feel ignorant and put down. Of course they *are* ignorant about some things, but your job is to change that, and monologues aren't the way. Instead, start off with activity and participation.

: Avoid giving a lecture filled with history or jargon. True, names are important and some will have to be learned. This will happen naturally as students work through assignments. Provide a handout with important terms listed (no definitions). Leave space on the handout for students to jot down their definitions (rather than yours) as they work.

: Make sure you have a "hands-on" session early.

: Make it clear that you expect students to work in pairs at first.

: Discuss the proper handling of disks quickly and without theatrics. Avoid too much detail and avoid scary stories.

: Show the students how to exercise some control over their computer. Let them experiment with the video monitor controls and the power switches, with the booting procedure and with the methods for correcting typing errors. Don't get carried away - just the basics.

: Keyboards with an auto-repeat feature cause all sorts of problems and mysterious events. Discuss this early. Use the verb "tap" instead of "press."

: Use an overhead transparency or large poster which shows the layout of the computer keyboard and the names of special symbols. You must not assume that students are as familiar with keyboards as you are.

: Start the practical session with some specific small activity, related to some familiar territory which will provide early and obvious success. There is for instance, some keyboard-familiarization software that's very good for this.

: There are several examples of tutorial software available which provide a non-threatening introduction to the hardware, operating system, or applications software. Several of these have humorous ways of handling errors. Many students, concerned about errors and about feeling silly, won't make many of them and will miss the fun. Encourage exploration and playfulness.

- Provide assignments which encourage discussion and teamwork.
- Avoid structured-walkthroughs as much as possible. Students don't do well in situations where the instructor is shouting instructions at their backs. Rely instead on carefully thought-out written instructions that allow students to work at *their* speed rather than at yours.
- If you *must* shout instructions for students to execute all together, go slowly. Many novices will take quite a while to absorb your instruction, look down, find the correct keys, press them, then look up and finally absorb the information on the screen. *You* may know that only one small part of the screen has changed, but the student doesn't because (s)he was looking down when it occurred.
- Students, especially nervous novices, will need to be reminded to *read* prepared instructions carefully. They will be more likely to skim the first few lines and dive in.
- Circulate, visit, joke, enjoy.
- Don't rush the students. However, have some "extra for experts" work ready.
- Steer early finishers towards students who are experiencing difficulty. Refer to these helpers as "coaches" or "peer advisors."
- Avoid answering questions too quickly. Help students look for clues to what went wrong. As them what *they* think might have happened.

: Near the end of the first practical session, take a few moments to discuss the origins of error messages. Help students to understand that these are determined by programmers and that the computer doesn't know what it is saying.

: Students will feel somewhat "charged up" by a successful practical experience. Take a moment to discuss this feeling of elation, as well as the possiblity of impending mental overload. Help students keep their perspective on the real world.

: End the first practical session with an encouraging word and a break. Urge students to get up and walk around; to leave the computers and visit for a while.

6. General Considerations for Class Meetings.

: Chose a modular approach for your presentations. Organize the material into mind-sized pieces with closure and a break after each piece. Avoid long complicated introductions to large multifaceted assignments.

: If you *must* keep the class listening to you for a while, be candid about how long you're *really* going to talk, and give people time to get comfortable.

: Students will *accept* long lectures but that doesn't mean they *prefer* them. Active learning promotes achievement, retention and a sense of ownership.

: Taking some time to expose fears and tensions is important. It should be done in the first meeting, perhaps at the end of the first practical session. Adult students bring many concerns and misconceptions to class with them. The simple act of naming their fears, in non-judgmental fashion, helps a lot. Here are some samples, to "prime the pump:"

- "Only geniuses understand computers."
- "I've always been a slow learner and I'm not going to keep up with the others."
- "Computing is a male-only preserve."
- "To be good with computers you have to be good at Math."
- "I'll never be any good at Math."
- "If I try something and I fail, I feel put down. I'm going to feel that way here."
- "When I use the computer at work and something unusual happens, the Data Processing man treats me like a delinquent child. That is going to happen here."
- "I've heard so many horror stories involving computers I'm quite reluctant to experiment."
- "My memories of school aren't very positive. I'm not going to enjoy it here."
- "I haven't been back to school for so long I've forgotten how to learn."
- "I'm too old to be a beginner."
- "I'm nervous about not being in control of the situation here. I don't like the feeling that someone else is pulling strings."

: Help students cope with their fears and phobias in harmless ways. For example, you might say "I'm going to press the wrong key now. You'll likely do this accidently sometime soon and the computer will beep rather loudly. You'll feel embarrassed when this happens." This techniques allows students to experience some of their concerns vicariously and to learn to control them.

: Some students will be rather seriously deficient in necessary background skills and knowledge, or will harbour some crippling misconceptions. Be sensitive to these difficulties and resolve to deal with them privately while other students work on independent assignments.

: At some point during the first or second meeting, your students ought to be given the chance to see the inside of their computer. They should have some things to pick up and examine. Keep the session short and don't overload them with new terms. Stress activity and participation over lecture.

: Try to reduce the mystique of computers by avoiding catastrophic terms like "never, always, totally destroy,..."

: Connect new things with familiar objects and ideas. For example, a floppy disk can be described as a piece of plastic coated with rust; a silicon chip can be referred to as a piece of refined sand; RAM can be likened to a bathtub that stays full until someone pulls the plug.

: If equipment allows, let students go to work on their own computer when they are ready to. Simply move in a second computer and let the pair work side by side.

: Don't be uncomfortable if there are some idle computers. It's a good idea to have extras in case of breakdown or for a special private session with a student.

- Try to reserve one or two machines solely for printing.
- Group interaction is effective for adult learners. They are more socially mature than children. Older adults benefit even more.
- Arrange for some assignments, or parts of assignments, to be done in class by groups of four or six students working together and interacting. Be prepared for some reduction in productivity, offset by gains in participation, positive attitudas, and self-confidence.
- Group work greatly enriches your course because each member of a group benefits from the diverse experience of other members.
- When the students share a common employer or profession, the group activities provide a rare opportunity for peer interaction on a different level than staff room or hallway chats.
- Take care not to influence the work of groups too much. Be available for consultation but let them work. Let them take charge of their learning. If the activities are correctly chosen and carefully designed, the experience will be positive.
- Use friendly competition, but sparingly. No prizes should be offered other than personal satisfaction. Make the "opponent" the computer or some problem which you provide.
- Difficult material *should* be included. Don't remove challenge. The key is to be clear about your expectations,

provide a clear goal, provide references and allow adequate time for students to work and interact.

: Issue frequent reminders that discomfort and tension are an integral part of learning. Foul-ups must be experienced.

: Show that you have read and heard students comments about expectations, by referring to these comments and by identifying changes to the flow and content of the course which happened because of what you read and heard.

: Continue the assessment of your effectiveness. Check for understanding. Check for attitude. Check for unfilled needs and expectations. New insights will be available if you look for them. These polling activities help students identify with their new learning, to build a sense of "ownership" which will promote achievement and positive attitudes.

: Be alert for people wearing glasses, especially bifocals. They may have touble focusing on the screen and keyboard. You may not be able to do much about it, but just showing concern will help.

: You may be too active and involved to notice the room growing warm and stuffy. Check with the group regularly about creature comforts.

: Use the information from student autobiographies to add to your stock of meaningful examples and assignments.

: Try to avoid *contrived* examples and practice problems. Use raw material taken from the students' experiences. Successful transfer of the classroom learning to real situations is greater when practice models real situations.

- Provide lots of practice time. Simple concepts are only simple to people who have mastered them. No new skill is so obvious that it can withstand poor presentation.
- When you provide students with step-by-step directions on paper, let them work on them independently. Avoid asking them to "all work through this paper together."
- Avoid interrupting students during practical session for announcements and advice.
- Allow students the opportunity for frequent little successes as well as the time to *savour* them. There is no shame in helping adult learners to *feel* successful.
- Tests and graded assignments should not be created on the spur of the moment. They should clearly reflect course goals.
- By all means ask "Are there any questions?" frequently and earnestly. However, having *asked*, you must now *wait* for response. Thirty seconds is not too long.
- An alternative to "Any questions?" is "How am I doing so far?"
- When a question is asked, *listen*. Often the simple act of formulating a question successfully is all the students needs. Don't cut them off in your rush to provide an answer. Probe for information, Divert the question to another student. Reflect it back to the questionner. Discuss relevant references. Novices often fail to trust their intuition and feel ashamed when they do. Answer only when other avenues fail.
- Resist the temptation to resort to a "quick fix" solution to a student's problem. Don't reach in and take control of a

keyboard.

: Be alert for signs that a student is losing control of his/her learning. Remarks like "What do I do next?" or "Tell me what to do." or "I don't know where I am." are clues that this is occurring.

: Too often, a simple answer grows into a boring, jargon-filled monologue which slows the momentum of the session. Keep your answers brief. If there is more that needs to be said, make a date with the student for a later time.

: When you use a new term, take time to repeat it slowly several times and to write it on the board or overhead. It is embarrassing for a student who wants to ask a question but can't pronounce some of the words correctly.

: Acronyms are especially common in "computerese" and need special attention. It is less important to expand the acronym into its components as it is to clearly identify acronyms when they occur. Students won't, for instance know that *BASIC* is an acronym which has nothing whatever to do with the difficulty of the language!

: Words cause all sorts of problems because they mean different things in different contexts. They can also evoke very different mental images. This can't be avoided, only reduced by a sensitive instructor. For example, when you say "head crash," you may have inadvertently upset a student-mother who suddenly recalled a painful image of her daughter's stitched forehead after a bad fall.

: The many special keystroke sequences required by operating systems and applications software are mysterious to students because they don't realize that most of them have no inherent significance. Explain that they are using a limited keyboard, meant for typewriters, to do pretty fancy work. Special instructions to the computer can only be sent with some rather queer keystroke sequences.

: Oftentimes a question is in the minds of several students, but only one will actually ask it. Congratulate him/her.

: Don't be concerned if a few students are asking most of the questions. It is however, serious if these few students are the only ones listening to the answers! If this occurs, your replies are too obscure and long-winded.

: Be candid about your limitations. If you don't know an answer or aren't sure of it, say so. Your own path to the exalted station of "computer expert" *must* be marked by gaps, failures and frustrations. Talk about them.

: Use questions asked during class and practice sessions as a guide for future improvement of your technique.

: Avoid situations where students are trying to listen to you, write notes, type, watch the monitor, and watch a projector screen, all at the same time. Provide reference handouts. Put step-by-step instructions on paper. Minimize lectures.

: Remind students frequently that they don't have to try and remember everything they see and hear. Novices often fixate on *details*, at the expense of general understanding.

: Encourage students to use every available aid when they are trying to remember something that won't "stick." Rhymes, jingles, recitations, associations, ... are all just fine.

: By your behavior, show that uncertainty (the state of not knowing all the answers) is a human condition which we usually accept.

: Novices often lose sight of the fact that learning a new skill involves numerous trials and errors. Remind them that mistakes are a normal part of learning, as any toddler knows.

: Use demonstrations and personal coaching to model the correct attitude towards error. Don't rush past an error. Savour it, examine it for clues. Involve the student. Demonstrate graceful (not to be confused with elegant or complicated) recovery from errors.

: Stress the virtues of *partial success.* Remind students that real-world successes are seldom complete ones. Most pilots, for instance, are quite satisfied with every "successful" landing, however imperfect it may be. Help your students shift their focus from negative to positive aspects of partial success. Reject the feeling that "There's so much to learn!" in favour of "Look how far I've come!"

: Consider using a "highlighting" marker pen on student handout sheets to mark special places as you coach and answer questions. Be prepared to provide a second unmarked copy.

: Avoid "troubleshooting" all the time. Turn part of that task over to laboratory assistants and peer tutors so you are free to circulate, joke, cajole, chat, encourage, and enjoy. Look for small successes which the student may not notice in the intensity of learning. Help him/her take time to savour them.

: Budget time for whole-class discussion (rather than lectures). Some could be free discussions and some could be kept to particular topics. Don't be alarmed at periods of silence.

: During lecture time, avoid relying too heavily on overhead transparencies. It is rare indeed to find an instructor who leaves prepared slides on the screen long enough for students to copy them. Even rarer is the instructor who provides actual paper copies of the slides to students ahead of time.

: As student confidence builds, you can introduce *some* new material in a new way, which more closely models the real world. Warn them ahead of time that they're going to be doing some "creative floundering." Give them a task which is beyond their present capabilities and experience, but which is possible to do with existing resources. Then give them time.

: Announce frequent breaks (about every hour) and encourage students to take some refreshment and to walk around.

: Socialize with students during breaks. After all, you should take one, too. Many remarks and questions will appear during these social times that would not be said nor asked in class.

: Some students will likely be willing to contribute to the refreshment area. That's a good idea.

: Solicit posters, cartoon, slogans, magazines and books for the classroom and laboratory.

H. The First and Last Few Minutes of Each Class Meeting

: Take a few relaxed moments for smalltalk and a chat at the beginning of each class meeting.

: Budget some time at the start of each class for brief discussion (by students, not you) of how the course is "going" and the direction its headed. Invite suggestions.

: Avoid launching into the session without first discussing your plan for the day. Tell students what they will learn during the session to come.

: Several times during the course, begin a class session by reminding students they are courageous. It takes courage to step away from familiar territory into unfamiliar terrain. Congratulate them.

: Start each class with review in which students *participate* actively. It's a good "mixer" and warmup activity. Keep it short and keep it moving. Don't mix your messages by doing review sessions reluctantly because you want to get going.

: Remember that some of the students will require review at a very basic level. (Stimulus-Response, Discrimination, ...) Allow them to repeat basic procedures (like booting or moving through menus) as often as they feel necessary. Neglecting practice at this level is a mistake.

: Students will perform better if they know where thev are going. When assigning a problem or exercise make sure the goal is clear. Don't hesitate to *show* a sample outcome. If applicable, let the students experience the sample answer by seeing it, touching it, and hearing it.

- Review at the end of each class session. Such reviews should stress accomplishment and closure. For example, have students write a column of numbers, 1 to 10. Make ten statements of fact derived from the work just completed. Students check off a number each time they hear a fact they "know."
- Refer regularly to the detailed course outline handout when reviewing at the end of a class.
- Make certain that each student takes some *thing* home after every class meeting. These mementos should be more than scribbled notes. Try to provide hard copies of their work, magazines, brochures, ... Consider photocopying several copies of interesting magazine articles and starting them rotating through the class week by week.
- Homework assignments are fine if they are collections of small jobs rather than one big one. Avoid assignments which require students to work on computers between classes unless you are *sure* this will happen. Many students are unable or unwilling to do so, for various good reasons.
- Pay attention to feelings. Tell students how you feel about their progress. Be positive.

I. The Final Class Meeting

- Avoid giving a final exam if possible. Use ongoing evaluation for any formal requirements.
- Include a final culminating "project" assignment in the final class meeting. This should be small enough that everyone can

complete it during the time allowed, but sufficiently open ended that "keeners" can do some extensions beyond the basic project.

- A "graduation exercise" is important. It doesn't have to be more than encouraging students to show their work to the rest of the class. One idea worth considering is to award each student with a subscription to an appropriate journal or with membership in a professional organization.
- Part of the last class meeting ought to be spent on an exchange of information amongst students. The goal here is to encourage later peer interaction and tutoring. For example, have each student fill out and post a small card with their name, phone number, topics they're willing to help out with, and area(s) they'd like to know more about.
- Provide some activities and exercises that students can do at work or home after the course has concluded. This will facilitate transfer, both vertical and horizontal.
- Part of your closing discussion ought to be a sharing of thoughts on "Where do I go from here?" The course work will have widened students' horizons and some may see greater job flexibility in their future. Facilitate a discussion about future professional possiblities, taking care to be encouraging but not to create any false hopes.
- Provide references to further training for students who wish to go on.
- Warn students that they will experience periods of frustration and reduced effectiveness as they try their new skills in

real situations.

- Some students will have to be mentally prepared for being regarded as the "local computer guru" at work. They might be regarded as experts in all sorts of fields because they took your course.
- Course Evaluation is often poorly handled. Written evaluations should be brief and have clear opportunities for constructive criticism. Make these evalustions an integral part of the closing meeting, not a last-minute duty for the students to perform as they leave.
- Include a discussion period as part of your class evaluation. Take care to listen and absorb, not defend.

J. After the Course Concludes.

- Use the written evaluations and remarks from students to improve your technique for the next occasion.
- Arrange to meet with former students to discuss the recent course and how it might be improved.
- It is very effective to contact former students and inquire about how they are getting along with their new skills and expertise.
- Try to be a continuing resource for support, references, and more practice problems. Model the behaviour you would like your former students to show to other people who ask for help and advice.

CONCLUSION

This would be a good time to recall one of the goals of this project: to improve the qualty of adult instruction by raising the sensitivity of the instructor. As you have seen from Part IV, there is much that can be done.

Why should you do it? Why should you put effort into this sort of thing? Several good reasons are listed in Part I. Here is another: It is change and renewal that keeps us fresh and makes us effective. John Dewey wrote "If teaching becomes neither terribly interesting nor exciting to many teachers, can one expect them to make learning interesting and exciting to students?"

APPENDIX 1 - INTERVIEWS

Ms. Sandra Allen	Adult Student; and Experienced Educator.	April 9
Mr. Gerald K. Bogen	Faculty, Department of Educational Policy and Management, U. of Oregon School of Education.	February 15
Mr. Regan Carey	Graduate Teaching Fellow, Department of Curriculum & Instruction, School of Education (U. of Oregon)	January 20
Ms. Doris Carey	Graduate Teaching Fellow, Department of Curriculum & Instruction, School of Education (U. of Oregon)	January 20
Mr. Brian Emmen	Continuation Centre, U. of Oregon.	April 12
Mr. Richard Freund	Department of Counselling and Educational Psychology, U. of Oregon; and Counselling Department, Lane Community college.	February 22 & March 1
Ms. Janice Hawley	Adult Student; and Experienced Educator.	April 4
Mr. Daniel Hodges	Director of Testing, Lane Community College (Eugene)	March 8 & April 12
Ms. Saundra Hopkins	Microcomputer Specialist, Oregon Total Information System.	April 11
Mr. Larry Horyna	Oregon Community Education Association; & Community Education Centre.	February 14
Mr. Al Hughes	Adult Student; & Energy Education Consultant at Eugene Water & Electric Board (EWEB).	April 2
Ms. Dianne Jarvis	Adult Student; & Customer Accounts Dept. (EWEB).	March 2 & May 1
Ms. Helen Kershner	Adult Student; & Supervisor of Word Processing (EWEB)	March 29 & April 30

Ms. Julia King	Alpha Health Care, & Continuation Centre (U. of Oregon).	February 13
Mr. Gerald D. Kranzler	Faculty, Department of Counselling and Educational Psychology (U. of Oregon).	February 23
Mr. Tom Lichty	Argyle and Wingtip Computer Services; & Continuation Centre (U. of Oregon).	April 5
Ms. Pat Martin	Adult Student; & Administrative Assistant, Graduate School (U. of O.)	April 5
Mr. Sam Miller	Faculty, Kennedy Jr. High School (District 4J, Eugene); & Instructor for Lane County ESD.	February 24
Ms. Fran Moravcsik	Adult Student; & Landscape Architect.	April 10
Ms. Barbara-Jo Novitski	Faculty, School of Architecture (U. of O.); & Continuation Centre.	April 3
Ms. Juanita Prigan	Adult Student, & Supervisor, Customer Accounts (EWEB).	March 2 & May 1
Ms. Dianna Sheridan	Adult Student; & Research Information Officer (U. of Oregon).	March 14
Mr. Ed Sheridan	Training and Development Manager (EWEB).	March 2
Mr. John Shirey	Instructor, Lane Community College.	March 6
Ms. Beverley Showers	Faculty, Division of Teacher Education, School of Education (U. of Oregon).	April 13
Ms. Phyllis Waddington	Adult Student; & Experienced Educator.	April 4
Mr. Richard Wanderman	Self-employed Instructor.	February 21

APPENDIX 2 - OBSERVATIONS

INSTRUCTOR	COURSE NAME/FOCUS	DATE 1984
Mr. Jerry Blakely (Continuation Centre, U. of Oregon)	Introduction to Microcomputers.	April 2
Mr. Brian Emmen	Microcomputer Applications for U. of O. Administrative Staff.	April 6 & April 12
Mr. Robert Haley	Microcomputers.	March 31 & April 7
Ms. Saundra Hopkins	Data Managers for Educators	May 17 & May 19
Ms. Julia King	Word Processing for U. of O. Faculty.	March 2
	Word Processing for U. of O. Staff.	April 3
Mr. Tom Lichty	Lotus 123 for EWEB Managers.	March 13
	Word Processing for U. of O. Staff.	April 3
	Lotus 123 for EWEB Staff. (two classes)	April 23 a.m. & p.m.
	Lotus 123 for EWEB Staff. (two classes)	May 4 a.m. & p.m.
Ms. Barbara-Jo Novitski	Microcomputer Graphics for Architecture Students.	March 29
Mr. Jerry Pergamit (DATCO Inc. & LCC)	Choosing a Small Business Computer.	March 27
Mr. Tim Riordon (Alpine Educational Computing Services.)	Data Managers for Home Economics Teachers.	April 6

APPENDIX 3 - BIBLIOGRAPHY

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